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(71) Applicant (for all designated States except US): KIMBERLY-CLARK WORLDWIDE, INC. [US/US]; 401 N. Lake Street, Neenah, WI 54956 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): NELSON, Denise, J. [US/US]; N1654 Ridgeway Drive, Greenville, WI 54942 (US). KELLENBERGER, Stanley, R. [US/US]; 306 W. Lindbergh Street, Appleton, WI 54911 (US). MCDONALD, Duane, L. [US/US]; 407 Kraft Street, Neenah, WI

54956 (US). RADWANSKI, Fred, R. [US/US]; 362 Nalley Drive, Stone Mountain, GA 30087 (US). ROESSLER, Thomas, Harold [US/US]; 3023 East Fallcreek Lane, Appleton, WI 54915 (US). WEYENBERG, Roman, A., Jr. [US/US]; 951 Appleblossom Drive, Neenah, WI 54956 (US).

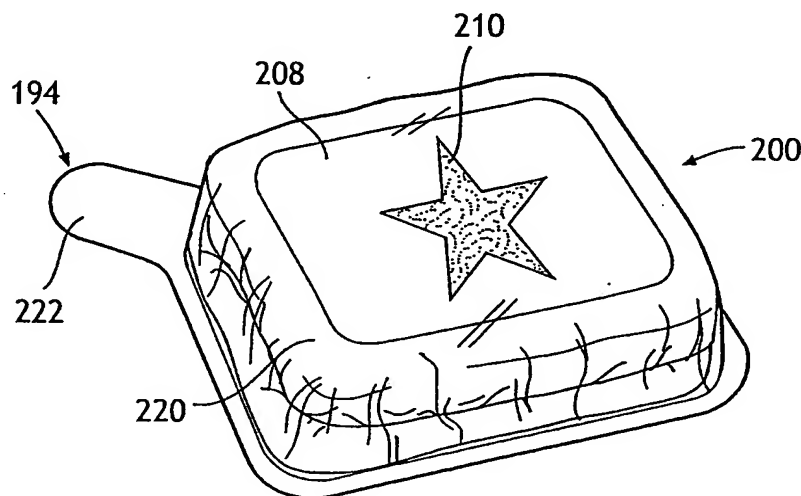
(74) Agents: PARKER, Thomas, M. et al.; Kimberly-Clark Worldwide, Inc., 401 N. Lake Street, Neenah, WI 54956 (US).

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[Continued on next page]

(54) Title: PACKAGE ENCLOSING A SINGLE DISPOSABLE ABSORBENT ARTICLE



(57) Abstract: A package enclosing a single disposable absorbent article. The single disposable absorbent article is in a compact configuration and situated within the package.

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**PACKAGE ENCLOSING A SINGLE DISPOSABLE ABSORBENT ARTICLE****REFERENCE TO PRIOR APPLICATION**

This is a continuation-in-part of U.S. Patent Application No. 10/366,872, filed February  
5 14, 2003, hereby incorporated herein by reference.

**BACKGROUND**

The present invention relates to a packaging of disposable absorbent articles. More particularly, the present invention relates to a package enclosing a single disposable absorbent  
10 article.

Absorbent articles such as, for example, diapers, training pants and adult incontinence garments are generally available to users in packages which include multiple articles therein. Frequently, these users often encounter situations away from home which would be satisfied with a single disposable absorbent article. As a result, users often carry single disposable absorbent  
15 articles about in purses, backpacks, briefcases and other containers until needed. Unfortunately, these containers do not always provide a hygienic environment for the disposable absorbent articles, and thus the articles can become dirty and/or damaged. Another situation arises when users are away from home and forget to pack even a single disposable absorbent article. These users typically have no alternative but to purchase multiple disposable absorbent articles in a  
20 single package. As a result, there remains a need to provide packaging suitable for enclosing a single disposable absorbent article.

**SUMMARY**

In response to the foregoing need, the present inventors undertook intensive research and  
25 development efforts that resulted in the discovery of unique packaging suitable for enclosing a single disposable absorbent article. One version of the packaging of the present invention includes a first piece of material and a second piece of material. The first piece of material and the second piece of material are operatively associated with one another to enclose the absorbent article. The package has at least one viewing region in at least one of the pieces of material. The  
30 absorbent article has a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface. The garment facing surface of the absorbent article has a graphic disposed on at least a portion thereof. The absorbent article is in a folded configuration and enclosed within the package in a manner such that at least a portion of the graphic is situated in

the viewing region. Additionally, the absorbent article has a ratio in the folded configuration to the unfolded configuration of no more than 0.15.

Another version of the present invention provides a package enclosing a single disposable absorbent article. The package includes a layer of material having an interior surface and an exterior surface. The layer of material has at least one viewing region and is configured to provide an interior space. The single disposable absorbent article has a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface. The garment facing surface of the single disposable absorbent article has a graphic disposed on at least a portion thereof. The single disposable absorbent article is in a folded configuration and situated within the interior space of the package in a manner such that at least a portion of the graphic is situated in the viewing region.

Still another version of the present invention discloses yet another package enclosing a single disposable absorbent article. The package includes a first piece of material, a second piece of material and an opening device. At least one of the pieces of material has at least one viewing region. The first piece of material and the second piece of material are operatively associated with one another to enclose the absorbent article. One of the pieces of material is more rigid than the other piece of material. The absorbent article has a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface. The garment facing surface has a graphic disposed on at least a portion thereof. The absorbent article is in a folded configuration and enclosed within the package in a manner such that at least a portion of the graphic is situated in the viewing region.

### DRAWINGS

The foregoing and other features and aspects of the present invention and the manner of attaining them will become more apparent, and the invention itself will be better understood by reference to the following description, appended claims and accompanying drawings, where:

FIG. 1 illustrates a plan view of one version of a disposable absorbent article in an unfolded, flat-out, uncontracted state (*i.e.*, with all elastic induced gathering and contraction removed), with the garment facing surface of the article facing the viewer and with portions of the article partially cut away to illustrate underlying features;

FIG. 2 illustrates a perspective view of a disposable absorbent article in a fastened configuration, generally similar to the configuration of the disposable absorbent article when it is fastened about a lower torso of a wearer;

FIG. 3 illustrates a plan view of a disposable absorbent article in which each side is folded over the center;

FIG. 4 illustrates a perspective view of the disposable absorbent article of FIG. 3 folded into a bifolded configuration;

5       FIG. 5 illustrates a perspective view of the disposable absorbent article of FIG. 3 folded into a trifolded configuration;

FIG. 6 illustrates a perspective view of the disposable absorbent article of FIG. 4 folded into a quadrifolded configuration;

FIG. 7 illustrates a perspective view of the disposable absorbent article of FIG. 4  
10       having each end folded over a center to provide generally an "S" configuration;

FIG. 8 illustrates a perspective view of the absorbent article of FIG. 4 which has each end folded inward to provide generally a "Pretzel" configuration;

FIG. 9 illustrates a perspective view of the disposable absorbent article of FIG. 3 which has been rolled into a generally cylindrical configuration;

15       FIG. 10 illustrates an apparatus for packaging disposable absorbent articles;

FIGs. 11A-11C illustrate different versions of packages in which disposable absorbent articles may be packaged;

FIG. 12 illustrates a partially folded disposable absorbent article having a graphic situated on at least a portion of the outer cover;

20       FIGs. 13A-13C illustrate different versions of packages having at least one viewing region;

FIG. 14 illustrates a version of a package formed from a first piece of material and a second piece of material;

FIG. 15 illustrates a version of a package formed from a layer or sheet of material; and

25       FIG. 16 illustrates another version of a package formed from a first piece of material and a second piece of material.

### DESCRIPTION

30       The unfolded configuration or footprint is intended to refer to a disposable absorbent article, such as a diaper, positioned in an unfolded, flat-out, uncontracted state (*i.e.*, with all elastic induced gathering and contraction removed), as illustrated in FIG. 1. Similarly, a pant-type disposable absorbent article, such as a training pant or an adult incontinence pant or garment is positioned by first cutting the article from each leg opening to the waist opening on each side (if the pant/garment is not provided with pre-existing openings in these areas), and positioning the

article in the unfolded and laid flat position described above. The folded configuration or footprint is intended to refer to a disposable absorbent article, such as a diaper, positioned in its folded position. Additional details of both configurations or footprints will be discussed below.

Although described herein primarily in the context of an infant diaper, one of skill in the art will readily appreciate upon reading this description that the present invention is also suitable for other disposable absorbent articles such as children's training pants and adult incontinence garments. An example of a disposable absorbent article, as illustrated in FIG. 1, is a diaper 20.

Turning now to FIG. 1, the diaper 20 is illustrated in an unfastened, laid flat with unretracted elastics and extended to ungathered length configuration with the surface of the diaper 20 (adapted to contact the wearer's garment) facing the viewer and with portions of the diaper 20 partially cut away to illustrate the underlying features. The illustrated diaper 20 defines a front waist region 22, a back waist region 24, a crotch region 26 that extends between and connects the front and back waist regions 22 and 24, a longitudinal direction or length dimension 38 and a lateral direction or width dimension 40. As used herein, the term "longitudinal direction" means the direction that is parallel to the length dimension (usually machine direction) of the diaper 20 and generally runs parallel to the longitudinal centerline or "y" axis of the diaper 20. As used herein the term "lateral direction" means the direction that coincides with the width direction which generally is perpendicular to the longitudinal or machine direction of the diaper 20 and generally runs parallel to the lateral centerline or "x" axis of the diaper 20.

Measurements of the area immediately within the outer perimeter or periphery 46 of the diaper 20 along the longitudinal direction 38 and the lateral direction 40 provide the area (Table 1) for the unfolded configuration or footprint of the diaper 20. The method of measurement is discussed below in Example 1A. The front waist region 22 includes the portion of the diaper 20 which, when worn, is positioned on the front of the wearer. The front waist region 22 further defines front ear regions 72 generally in the laterally outward portions of the front waist region 22. The back waist region 24 comprises the portion of the diaper 20 which, when worn, is positioned on the back of the wearer. The back waist region 24 further includes back ear portions 70. When the diaper 20 is worn, back ear portions 70 are usually overlapped over front ear regions 72, as illustrated in FIG. 2. The crotch region 26 of the diaper 20 includes the portion of the diaper 20 which, when worn, is positioned between the legs of the wearer and covers the lower torso of the wearer.

The diaper 20 defines a pair of longitudinal side edges 30, a pair of lateral waist edges 32, an interior or bodyfacing surface 34 (facing away from the viewer) which is configured to contact the wearer, and an exterior or garment facing surface 36, opposite the interior surface 34,

which is configured to contact the wearer's clothing in use. The illustrated diaper 20 also includes an outer cover 42 and a bodyside liner 44 which is connected to the outer cover 42 in a superposed relationship and an absorbent core 28. The absorbent core 28 is located between the outer cover 42 and the bodyside liner 44. The longitudinal side edges 30 of the diaper 20 are generally defined by the side edges 30 of the outer cover 42 which further define leg openings that are formed when the article is worn and may be curvilinear. The lateral waist edges 32 of the diaper 20 are generally defined by the waist edges 32 of the outer cover 42 and define a waist opening which is configured to encircle the waist of the wearer when worn. The absorbent core 28 is configured to contain and/or absorb bodily exudates discharged from the wearer. The diaper 20 may further include leg elastics 54, containment flaps (not illustrated) and waist elastics 58 as are known to those skilled in the art. It should be recognized that individual components of the diaper 20 may be optional depending upon the intended use of the diaper 20.

The diaper 20 may be of various suitable shapes. For example, in the unfastened configuration as illustrated in FIG. 1, the diaper 20 may have an overall rectangular shape, T-shape or a generally I-shape. In the configuration illustrated in FIG. 1, the diaper 20 has an approximately hourglass shape in an unfastened configuration.

The bodyside liner 44 suitably presents a bodyfacing surface which is compliant, soft feeling, and nonirritating to the wearer's skin. Further, the bodyside liner 44 may be less hydrophilic than the absorbent core 28, to present a relatively dry surface to the wearer and to isolate the wearer's skin from liquids held in the absorbent core 28.

The absorbent core 28 of the diaper 20, as representatively illustrated in FIG. 1, may suitably include a matrix of hydrophilic fibers, such as a web of cellulosic fluff, mixed with particles of a high-absorbency material commonly known as superabsorbent material (SAPs); in a particular aspect, the absorbent core 28 includes a matrix of cellulosic fluff such as wood pulp fluff and superabsorbent hydrogel-forming particles, namely, SAPs. The wood pulp fluff may be exchanged with synthetic, polymeric, meltblown fibers or with a combination of meltblown fibers and natural fibers. The SAPs may be substantially homogeneously mixed with the hydrophilic fibers or may be nonuniformly mixed. The fluff and SAPs may also be selectively placed into desired zones of the absorbent core 28 to better contain and absorb bodily exudates. The concentration of the SAPs may also vary through the thickness of the absorbent core 28. Alternatively, the absorbent core 28 may include a laminate of fibrous webs and SAPs or other suitable means of maintaining SAPs in a localized area.

The absorbent core 28 may have any of a number of shapes. For example, the absorbent core 28 may be rectangular, I-shaped (including an hour glass shape, or a shape which is

expanded outward at one or both ends), T-shaped, and so forth. It is generally desired that the absorbent core 28 be narrow in the crotch region 26 of the diaper 20. The size and the absorbent capacity of the absorbent core 28 should be compatible with the size of the intended wearer and the liquid loading imparted by the intended use of the absorbent article.

5           The high absorbency material or particles, *i.e.*, SAPs, may be in any of a wide variety of geometric forms. In general, it is desired that the high absorbency material be in the form of discrete particles, SAPs, which may take any of a number of shapes. The SAPs are generally present in the absorbent core 28 in an amount of from about 5 to about 90 weight percent based on total weight of the absorbent core 28. Desirably, the SAPs are present in the absorbent core  
10       28 in an amount of from about 20 to about 90 weight percent based on the total weight of the absorbent core 28. More desirably, the SAPs are present in the absorbent core 28 in an amount of from about 30 to about 90 weight percent based on the total weight of the absorbent core 28. Yet even more desirably, the SAPs are present in the absorbent core 28 in an amount of from about 40 to about 90 weight percent based on the total weight of the absorbent core 28. SAPs are  
15       well known to those skilled in the art and are commercially available from a number of suppliers, including The Dow Chemical Co., BASF, and Stockhausen, Inc.

A fastening system helps maintain the initial fastened position of the diaper 20 during use so as to maintain proper tension and ultimately proper fit. As illustrated in FIGs. 1 and 2, the diaper 20 includes the back ear portion 70, which has fasteners 60. The fasteners 60 may include  
20       an attachment portion 66, such as an adhesive, desirably a pressure sensitive adhesive. Alternatively, the attachment portion 66 may include a hook material, and so forth. The front waist region 22 includes a landing zone 80. If the attachment portion 66 of the fastener 60 is an adhesive, the landing zone desirably includes a material configured to receive and hold an  
25       adhesive fastener thereto. Alternatively, if the attachment portion 66 of the fastener 60 is a hook material, the landing zone desirably includes a loop material for releasably coupling the hook material thereto. In use, the caregiver overlaps each back ear portion 70 and fastener 60 over the front waist region 22 and engages the fasteners 60 to the landing zone 80, as illustrated in FIG. 2, creating an overlap region 104 which holds the diaper 20 in position about a torso.

Turning now to folding configurations or "footprints", a disposable absorbent article,  
30       that is, for purposes of illustration only and not by way of limitation, the diaper 20 illustrated in FIGs. 1 and 2, is folded to provide a reduced or more compact configuration or footprint. The various compact footprints, created by different folding techniques, are compared to the unfolded footprint, that is, the measurement of the area as defined immediately within the outer perimeter or periphery 46 of the diaper 20, as described in detail in Example 1A, and the results are



provided in Table 1. Each folded compact configuration of each article, namely, the diaper 20 described below and illustrated in FIGs. 4 through 9 is measured along a longitudinal direction or length dimension 138 (generally along a line running parallel to the y axis) and a lateral direction or width dimension 140 (generally along a line running parallel to the x axis).

5           In addition, a depth dimension 142 (generally along a line running parallel to the z axis; the z axis residing in a plane oriented perpendicular to the x and y axes) is measured in both the unfolded footprint of the diaper 20, and the folded footprint. The description of the measurement of the depth dimension will be described in the Examples, below. Therefore, area and volume calculations of each folded article compared to the unfolded article are provided in Table 1.

10           In initially folding a disposable absorbent article such as, by way of non-limiting example, a diaper 20, each side 148 is optionally folded inward, including the back ear portions 70 and the front ear regions 72, over the area containing the absorbent core 28, as illustrated in FIG. 3. The diaper 20 is folded at approximately the center 144 to provide a bifolded diaper 20 having two overlapping panels 150 of approximately equal length, as illustrated in FIG. 4.

15           In an alternative, as illustrated in FIG. 5, the diaper 20, folded initially as illustrated in FIG. 3 is folded such that each end 152 is folded over and overlaps about a third of the other to provide three approximately equal and overlapping panels 150. In this manner, a trifolded diaper 20 is provided.

20           In another alternative, as illustrated in FIG. 6, the bifolded diaper 20 of FIG. 4 is then overlapped again to provide a quadrifolded diaper 20 having four approximately equal and overlapping panels 150.

25           In yet another alternative, as illustrated in FIG. 7, the bifolded diaper 20 of FIG. 4 is then folded such that approximately one third of each bifolded end 154 of the folded diaper is folded over each side of a center portion to provide an "S" folded diaper having six approximately equal and overlapping panels 150.

          In still yet another alternative, as illustrated in FIG. 8, each end 154 of the bifolded diaper 20 of FIG. 4 is overlapped inwardly, toward a center portion 156 to provide a "Pr etzel" fold having eight overlapping panels 150.

30           In still a further embodiment, as illustrated in FIG. 9, the diaper 20 of FIG. 3 is rolled from one end to the other to form a generally cylindrical shape. This configuration, providing a continuous rotation of the diaper 20 around a center, differs from folds; it has no planar surface in the folded configuration, other than each end, since it forms, generally, a cylindrical shape. It will be understood, however, that the present article may be folded in any manner consistent with

the present invention, and the foregoing folding techniques and rolled technique are not intended to limit the scope of the invention.

In folding the article, folding the fasteners 60 is typically taken into consideration. Fasteners 60 desirably are not folded in the width 40 (cross-machine) direction, because such  
5 folding impacts the ability of the attachment portions 66 to fasten to the landing zone 80. Damage to the attachment portions 66 may occur if the fastener 60 is bent such that a portion of the fastener 60 lies in one plane while another portion lies in a curve and/or another plane. Specifically, the attachment portions 66 may be damaged such that they are not capable of maintaining a sufficient contact with the landing zone 80, thereby causing the article to unfasten  
10 from a torso. Therefore, the fasteners 60 are desirably maintained in a consistent plane or planar surface when folded with the article in any of the foregoing folded configurations so that the fastener 60 and attachment portion 66 thereof is lying substantially within the same plane.

The article may be folded by hand or by machine (not illustrated). The article is then packaged.

15 Illustrated in FIG. 10 is one method and apparatus 157 of packaging an article. In this example, a first reel 158 has sheet material 159 which is rotatably supported on a bed 160 having a vacuum cavity former 162 provided where the article is disposed. Articles, such as, for example, the diaper 20 folded as illustrated in FIG. 7, are provided at a loading station 164 and they are disposed on the sheet material 159 over the cavity former 162. The articles are carried  
20 to a packaging station 165 which has a vacuum chamber (not illustrated). The packaging station 165 also contains film (not illustrated) and a sealing apparatus (not illustrated) for sealing the articles in the cavities while they are in the vacuum chamber. The articles in the forming cavities 162 are carried into the packaging station 165 and the chamber is closed. A vacuum is applied to the articles and the cavities 162, and film is then positioned and sealed over each cavity via  
25 sealing devices, such as thermal sealing, ultrasonic bonding, or any other sealing methods known by those skilled in the art. The vacuum depressurizes the chamber in the packaging station to a pressure which is less than the atmospheric pressure outside of the chamber. After the package is sealed, the vacuum is removed from the chamber, and the chamber and the article sealed in the package are permitted to return to regular atmospheric pressure, which results in compression of  
30 the article in the package, providing a soft package (form-fill-seal) which is formed about the article. The packaged article 190 may thereafter be removed (not illustrated). It will be appreciated that many techniques and apparatus for vacuum packaging are known to those skilled in the art, and are commercially available. A variety of packaging devices may be utilized.

The amount of vacuum is typically an amount necessary to result in compression of the article so that it may be contained and reduced in size within and along with the package. The amount of vacuum suitable for use in packages of the present invention is generally no more than 32; alternatively, no more than 31; alternatively, no more than 30; alternatively, no more than 29; alternatively, no more than 28; alternatively, no more than 27; alternatively, no more than 26; alternatively, no more than 25; alternatively, no more than 20; alternatively, no more than 15; alternatively, no more than 14; alternatively, no more than 13; alternatively, no more than 12; alternatively, no more than 11; alternatively, no more than 10; alternatively, no more than 9; alternatively, no more than 8; alternatively, no more than 7; and finally, alternatively, no more than 6 inches of Mercury. The amount of vacuum suitable for use in packages of the present invention is generally no less than 5; alternatively, no less than 6; alternatively, no less than 7; alternatively, no less than 8; alternatively, no less than 9; alternatively, no less than 10; alternatively, no less than 11; alternatively, no less than 12; alternatively, no less than 13; alternatively, no less than 14; alternatively, no less than 15; alternatively, no less than 17; alternatively, no less than 23; alternatively, no less than 25; alternatively, no less than 26; alternatively, no less than 27; alternatively, no less than 28; alternatively, no less than 29; alternatively, no less than 30; and finally, alternatively, no less than 31 inches of Mercury. Thus, the amount of vacuum may be no less than 5 up to no more than 32 inches of Mercury; although the approximate amount of vacuum may vary according to, *inter alia*, the general design and intended use of the package.

The disposable absorbent article is sealed in a package desirably constructed of a material with a substantially low gas permeability, including, but not limited to, a polymeric film, such as, by way of non-limiting example, a polyethylene terephthalate (PET), a polyvinylidenechloride (PVDC), having an oxygen transmission of about less than 3.0 cc/100 in<sup>2</sup>/24 hours at 73 °F and 0 % relative humidity (RH). Multilayer films, each providing a different function, may be utilized. For example, one layer may have a heat sealable property, such as polypropylene or polyethylene, another layer may provide strength, such as polyester and/or nylon, and another layer may provide substantially reduced gas permeability, such as PET or PVDC. Also, films with reduced permeability to vapors (that is, films that have substantially low gas permeability or are substantially gas impermeable for a variety of applications) can themselves be composites, such as where one layer is a flexible polymer, such as polyurethane, polyethylene, ether polyurethane, or polypropylene, while another layer is coated on or coextruded and serves as a barrier layer. Barrier layers can generally be viewed as substantially organic based or substantially inorganic based. However, it will be appreciated that a variety of materials having

substantially low gas permeability or substantially gas impermeable material(s) known in the art may be suitable for use in the present invention.

Desirably, with a substantially low gas permeable material and/or package, the gas permeability rate is no more than 5; alternatively, no more than 4; alternatively, no more than 3; alternatively, no more than 2; alternatively, no more than 1; alternatively, no more than 0.5; and finally, alternatively, no more than 0.1 cc/100 in<sup>2</sup>/24 hours. The gas permeability rate is no less than 0.05; alternatively, no less than 0.1; alternatively, no less than 0.5; alternatively, no less than 1; alternatively, no less than 2; alternatively, no less than 3; alternatively, no less than 4; and finally, alternatively, no less than 4.5 cc/100 in<sup>2</sup>/24 hours. Thus, the gas permeability rate may be no less than 0.05 up to no more than 5 cc/100 in<sup>2</sup>/24 hours; although the approximate gas permeability rate may vary according to, *inter alia*, the general design and intended use of the package.

A number of different packages may be utilized which are suitable for use with the present invention. Types of packages which are particularly suitable include, but are not limited to form-fill-seal packages, blister packages, injection molded packages (with and without living hinges), heat sealed pouches, thermally formed trays with lids, and a variety of other packages known to those skilled in the art.

Before a disposable absorbent article is packaged, and while a disposable absorbent article is being packaged, it is desirable to maintain a low moisture level. High moisture levels may result in hydrogen bonding in the absorbent core of the article. Therefore, a disposable absorbent article is desirably packaged and maintained with an absorbent core at a moisture level of no more than 10; alternatively, no more than 9; alternatively, no more than 8; alternatively, no more than 7; alternatively, no more than 6; alternatively, no more than 5; alternatively no more than 4 alternatively, no more than 3; alternatively, no more than 2; and finally, alternatively, no more than 1 percent. A disposable absorbent article is desirably packaged and maintained with an absorbent core at a moisture level of no less than 0.5; alternatively, no less than 1; alternatively, no less than 2; alternatively, no less than 3; alternatively, no less than 4; alternatively, no less than 5; alternatively, no less than 6; alternatively, no less than 7; alternatively, no less than 8; and finally, alternatively, no less 9 percent. Thus, a disposable absorbent article is desirably packaged and maintained with an absorbent core at a moisture level ranging between no less than 0.5 up to no more than 10 percent; although the approximate moisture level may vary according to, *inter alia*, the general design and intended use of the package.

In addition, it is advantageous to control heat during folding and packaging the disposable absorbent article. The temperature of at least the absorbent core is desirably kept below about 110 °C. Even more desirably, the temperature of at least the absorbent core is kept below about 80 °C. Yet even more desirably, the temperature of at least the absorbent core is kept below about 50 °C. Still even more desirably, the temperature of at least the absorbent core is kept below about 24 °C.

FIGs. 11A-11C illustrate several different packaged compact absorbent articles 190. Package 192A illustrates a form-fill-seal package holding a compact absorbent article 190A (such as, for example, the article illustrated in FIG. 7), as also generally illustrated in FIG. 10. Package 192B, as illustrated in FIG. 11B, is a blister package having a living hinge and holding a compact absorbent article 190B (such as the article illustrated in FIG. 9). FIG. 11C illustrates an injection molded package having a living hinge (not illustrated) which holds a compact absorbent article 190C. The packages 190A-190C may include curvilinear corners, and/or desirably provide size information (FIG. 11A) for the compact absorbent article contained therein, as well as one or more attractive decorations, such as one or more letters, numbers, symbols, designs and/or patterns, an area to write a user's name and other information, and so forth. In addition, a wet sheet packet, a lotion packet, a changing sheet, a disposal bag, one or more coupons, and so forth may also be included on an inside of the package, as illustrated in 190C, or on an outside of the package (not illustrated). Desirably, each package 190A-190C will open without any small pieces of the package tearing away separately, which is undesirable in the presence of small children and infants.

As illustrated in FIG. 11A, the package 192A may have an opening device 194 such as, for example, a pull tab. The pull tab desirably extends beyond a perimeter 196 of the package 192A, so that it is easy to grasp between a thumb and a finger by a caregiver, and permits easy opening of the package while maintaining the package 192 in one piece after being opened, and after the article has been removed.

The pull tab illustrated in FIG. 11A may be formed as a portion of the top material 197 of the package 192A, and optionally is not coterminous with the bottom material 198 of the package 192A to which the top material 192 is sealed. The pull tab may have pull indicia such as words, symbols, and so forth (for example, but not by way of limitation, "Pull Here" illustrated in FIG. 11A). The pull tab may be formed of a thicker material, or may be embossed or otherwise textured, and so forth, to provide easy grasping and pulling by a caregiver. The pull tab may be formed in one or more corners of the package 192A, or one or more pull tabs may be

provided on any portion(s) of the package 192A (not illustrated). Desirably, the edges of the pull tab are curvilinear.

In one suitable version of the present invention, similar to that illustrated in FIG. 15, a package 200 is formed from a layer or sheet of material having an interior surface (not shown) and an opposing exterior surface 206. The sheet of material is configured to provide an interior space. The sheet of material also has at least one viewing region 208. The package 200 so formed is well suited to enclose a disposable absorbent article 20. The disposable absorbent article 20 has a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface. Disposed on at least a portion of the garment facing surface of the disposable absorbent article 20 is a graphic 210. The disposable absorbent article 20 is in a compact configuration and situated within the interior space of the package 200 in a manner such that at least a portion of the graphic 210 is in the viewing region 208.

In another suitable version of the present invention, representatively illustrated in FIGs. 13A, 14 and 16, a package 200 is formed from a first piece of material 220 that is operatively associated with a second piece of material 222. (As illustrated in FIG. 14, a corner of the second piece of material 222 is turned up as it may be while being opened by a consumer.) The package 200 so formed is well suited to enclose a disposable absorbent article 20. At least one of the pieces of material is typically more rigid than the other piece of material. Moreover, at least one of the pieces of material has at least one viewing region 208. The disposable absorbent article 20 has a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface. Disposed on at least a portion of the garment facing surface of the disposable absorbent article is a graphic 210. The disposable absorbent article 20 is in a folded configuration and situated within the package 200 in a manner such that at least a portion of the graphic 210 is in the viewing region 208. In an optional configuration, as illustrated in FIGs 13A and 14, the first piece of material 220 is configured to have a depth and the second piece of material 222 is configured as a lid.

The difference in rigidity between the two pieces of material may result from the same type of material being used for both pieces of material, but one piece of material being thicker or thinner than the other piece of material. One of skill in the art will also appreciate that the difference in rigidity may be obtained by a variety of other means such as by using two different materials of the same or similar thickness. The differences in rigidity can be determined by a variety of techniques known to those of skill in the art, including determining the Gurley stiffness of each piece of material. A suitable technique for determining Gurley stiffness is set forth in TAPPI T543 PM-84.

The viewing region 208 may be in a variety of shapes such as droplets, circles, parallelepipeds, or the like. Specifically, the viewing region 208 may be situated in a variety of locations on the package 200 and may be either transparent or translucent. A possible viewing region 208 can result from a blend of polymer with no added pigment. The viewing region 208 described herein can be the entire package or a portion of the package. Moreover, it will be readily appreciated that the packages of the present invention may have situated thereon more than one viewing region.

The term "graphic" is intended to refer to written, printed, drawn or engraved characters, figures, objects, letters and/or words, numbers, and the like, including, but not limited to permanent graphics, active graphics, and the like. The term "permanent graphic" is intended to refer to a graphic that does not substantially change its degree of visibility when the disposable absorbent article is insulted with urine and when the disposable absorbent article is exposed to the environment, in simulated use conditions. The term "active graphic" is intended to refer to an appearing graphic, a fading graphic, or a combination of appearing and fading graphics. The term "appearing graphic" is intended to refer to a graphic that becomes visible or becomes significantly more visible when exposed to urine, or that becomes visible or becomes significantly more visible with the passage of time when exposed to the environment, but not exposed to urine. Conversely, the term "fading graphic" is intended to refer to a graphic that becomes invisible or significantly less visible when exposed to urine, or that becomes invisible or significantly less visible with the passage of time when exposed to the environment, but not exposed to urine. "Graphic" and other graphic-related terms are described in greater detail in U.S. Patent No. 6,297,424, issued to *Olson et al.*, the entirety of which is hereby incorporated herein by reference to the extent that it does not conflict with the present description.

As used herein, the term "operatively associated" is intended to refer to: configurations in which at least a portion of a first piece of material is directly joined to at least a portion of a second piece of material; configurations wherein at least a portion of a first piece of material is indirectly joined to at least a portion of a second piece of material by affixing at least a portion of the first piece of material to intermediate elements or members which in turn are affixed to at least a portion of the second piece of material; configurations in which at least a portion of a single piece of material is directly joined to at least another portion of the single piece of material; and configurations wherein at least a portion of a single piece of material is indirectly joined to at least another portion of the single piece of material via intermediate elements or members. At least a portion of the operatively associated material(s) is configured to allow a

consumer to separate the material(s) to an extent sufficient to allow the consumer to remove the disposable absorbent article from its package.

Desirably, the absorbent article 20, when packaged, will have a configuration that permits it to be placed in a purse, a jacket pocket, a pants pocket, or a shirt pocket. Each type of pocket has somewhat different dimensions, but generally, it is desirable to have an article 20, for example, a single packaged diaper, which has a width dimension of less than 6 inches, a length dimension of less than 11 inches, and a depth dimension of less than 1.75 inches. More desirably, the article 20 will have a width dimension 138 of less than 5 inches, a length dimension 140 of less than 5.5 inches, and a depth dimension of less than 1.5 inches. Even more desirably, the article 20 will have a width dimension of less than 4.6 inches, a length dimension of less than 4.0 inches, and a depth dimension of less than 1.75 inches. Yet even more desirably, the article 20 will have a width dimension of less than 4.6 inches, a length dimension of less than 3.8 inches, and a depth dimension of less than 1.3 inches. Such ranges described herein provide a footprint, that is, an area, or projected area, as well as a volume for the packaged absorbent article 20 so that it easily fits into a shirt pocket, a pants pocket, a jacket pocket, a small purse, and so forth, to provide ease in carrying and concealing the article 20.

In addition it may be desired that the package enclosing the single disposable absorbent article have a thickness or depth dimension of no more than 6.35 mm. Such a thickness or depth dimension would render the package enclosing the single disposable absorbent article suitable for receiving a favorable postage rate when deposited with the United States Postal Service.

The area or footprint of the folded absorbent article is compared to the unfolded and laid flat with unretracted elastics and extended to ungathered length configuration of the article (as exemplified by the disposable diaper (20), as provided in Table 1. Table 1 provides the area for the unfolded and laid flat article positioned as described above, as well as the area for each different type of folded absorbent article. Desirably, the ratio between the folded configuration and the unfolded configuration is no more than 0.15; alternatively, no more than 0.14; alternatively, no more than 0.13; alternatively, no more than 0.12; alternatively, no more than 0.11; alternatively, no more than 0.10; alternatively, no more than 0.09; alternatively, no more than 0.08; alternatively, no more than 0.07; alternatively, no more than 0.06; and finally, alternatively, no more than 0.05. Desirably, the ratio between the folded configuration and the unfolded configuration is no less than 0.04; alternatively, no less than 0.05; alternatively, no less than 0.06; alternatively, no less than 0.07; alternatively, no less than 0.08; alternatively, no less than 0.09; alternatively, no less than 0.10; alternatively, no less than 0.11; alternatively, no less than 0.12; alternatively, no less than 0.13; and finally, alternatively, no less than 0.14. Thus, the



ratio between the folded and unfolded configuration of a disposable absorbent article typically is no less than 0.04 and no more than 0.15; although the approximate ratio may vary according to, *inter alia*, the general design and intended use of the disposable absorbent article.

When a disposable absorbent article is packaged, it is anticipated that its size will be reduced in at least two dimensions. As measured in two dimensions, *i.e.*, width and length (area = inches<sup>2</sup>), and compared against a substantially similarly folded un-packaged article (*e.g.*, Examples 1 and 4D), the disposable absorbent article is desirably reduced in area by no less than 5; alternatively, no less than 6; alternatively, no less than 7; alternatively, no less than 8; alternatively, no less than 9; alternatively, no less than 10; alternatively, no less than 11; alternatively, no less than 12; alternatively, no less than 13; alternatively, no less than 14; alternatively, no less than 15; alternatively, no less than 17; alternatively, no less than 20; alternatively, no less than 21; alternatively, no less than 22; alternatively, no less than 23; and finally, alternatively, no less than 24 percent. The disposable absorbent article is desirably reduced in area by no more than 25; alternatively, no more than 24; alternatively, no more than 23; alternatively, no more than 22; alternatively, no more than 21; alternatively, no more than 20; alternatively, no more than 18; alternatively, no more than 15; alternatively, no more than 13; alternatively, no more than 10; alternatively, no more than 9; alternatively, no more than 8; alternatively, no more than 7; and finally, alternatively, no more than 6 percent. Thus, the disposable absorbent article is desirably reduced in area in an amount ranging between no less than 5 up to no more than 25 percent; although the approximate reduction in area may vary according to, *inter alia*, the general design and intended use of the disposable absorbent article.

When the disposable absorbent article is packaged and measured in three dimensions, *i.e.*, width, length and depth (volume = inches<sup>3</sup>), and compared against a substantially similarly folded un-packaged disposable absorbent article (*e.g.*, Examples 1 and 4D), the disposable absorbent article is desirably reduced in volume by no less than 10; alternatively, no less than 15; alternatively, no less than 20; alternatively, no less than 25; alternatively, no less than 30; alternatively, no less than 35; and finally, alternatively, no less than 40 percent. The disposable absorbent article is desirably reduced in volume by no more than 45; alternatively, no more than 40; alternatively, no more than 35; alternatively, no more than 30; alternatively, no more than 25; alternatively, no more than 20; and finally, alternatively, no more than 15 percent. Thus, the disposable absorbent article is desirably reduced in volume in an amount ranging between no less than 10 up to no more than 45 percent; although the approximate reduction in volume may vary according to, *inter alia*, the general design and intended use of the disposable absorbent article.

The volume of the compact absorbent article is desirably no more than 30; alternatively, no more than 29; alternatively, no more than 28; alternatively, no more than 27; alternatively, no more than 26; alternatively, no more than 25; alternatively, no more than 23; alternatively, no more than 20; alternatively, no more than 17; alternatively, no more than 15; alternatively, no more than 13; alternatively, no more than 10; alternatively, no more than 9; alternatively, no more than 8; alternatively, no more than 7; and finally, alternatively, no more than 6 in<sup>3</sup>. The volume of the compact absorbent article is desirably no less than 5; alternatively, no less than 6; alternatively, no less than 7; alternatively, no less than 8; alternatively, no less than 9; alternatively, no less than 10; alternatively, no less than 12; alternatively, no less than 18; alternatively, no less than 22; alternatively, no less than 25; alternatively, no less than 26; alternatively, no less than 27; alternatively, no less than 28; and finally, alternatively, no less than 29 in<sup>3</sup>. Thus, the volume of the compact disposable absorbent article typically is no less than 5 and no more than 30 in<sup>3</sup>; although the approximate volume of the compact disposable absorbent article may vary according to, *inter alia*, the general design and intended use of the disposable absorbent article.

### EXAMPLES

The following Examples describe various versions of the invention. Other versions within the scope of the claims herein will be apparent to one skilled in the art from consideration of the specification or practice of the invention as disclosed herein. It is intended that the specification, together with the Examples, be considered exemplary only, with the scope and spirit of the invention being indicated by the claims which follow the Examples.

#### Example 1

A diaper (HUGGIES® ULTRATRIM® Step 3 diaper, available from Kimberly-Clark Corporation, Neenah, Wisconsin) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was configured to fit an infant weighing about 16 to about 28 pounds. The diaper was folded by hand as illustrated in FIG. 7 and described previously in detail herein, in the "S" fold configuration, and positioned in a cavity formed from a material, namely, 611K--3 mil nylon with LLDPE coextrusion, available from Curwood, New London, Wisconsin, having at least one layer of a substantially low gas permeability or one layer of a substantially gas impermeable material, which was formed and positioned in a horizontal form/fill/seal packaging machine, in this instance, a RapidPak RP-55, manufactured by Alkar-Rapidpak, Inc., Lodi, Wisconsin. The top material, that is, the sealing cover, also having at

least one substantially gas impermeable layer, was a 48 gauge polyester film with 2 mils HDPE peel seal (coextrusion), available from Curwood, New London, Wisconsin. The top material was provided as a "peel back" material for a caregiver's convenience, and it was thermally sealed over the cavity while the cavity with the folded diaper therein was positioned in the vacuum  
5 chamber and a vacuum pressure in a range of about 20 to about 25 inches of Mercury relative to the existing atmospheric pressure was removed from the chamber. The chamber was then returned to existing atmospheric pressure, which resulted in compression of the package and the folded absorbent article therein. The packaged article was then removed from the chamber.

The dimensions of the S-folded diaper in its package were then compared to the unfolded  
10 dimensions of the Step 3 diaper disclosed in Example 4, which was measured as described in detail in Example 1A. The dimensions of the S-folded diaper in its package were then measured. The width was 4.250 inches and the length was 2.500 inches. The area of the perimeter or "footprint" was 10.625 inches<sup>2</sup>. The depth was 0.750 inches. The volume was 7.969 inches<sup>3</sup>. The ratio of the footprint of the S folded vacuum packaged diaper compared to its  
15 unfolded footprint was 0.06. The measurement did not include any portion of the package which extended beyond the perimeter of the diaper, but only the diaper contained within. As compared to the S folded but un-packaged diaper of Example 4D, the present vacuum packaging diaper only had about 78 percent of the area of the unpackaged S folded diaper of Example 4D (an about 22 percent reduction in area), and only had about 55 percent of the volume of the unpackaged S  
20 folded diaper of Example 4D (an about 45 percent reduction in volume).

TABLE 1. Diaper Dimensions

HUGGIES® ULTRATRIM® PREEMIE	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				99.59		
Bifold (Example 1A)	3.750	5.750	0.329	21.56	7.094	0.217
Trifold (Example 1B)	3.750	3.875	0.494	14.53	7.178	0.146
Quadri-fold (Example 1C)	3.750	2.873	0.658	10.78	7.094	0.108
S-Fold (Example 1D)	3.750	2.000	0.988	7.50	7.410	0.075
Pretzel Fold (Example 1E)	3.750	1.500	1.317	5.63	7.408	0.056

\*Folded to Unfolded Area

HUGGIES® ULTRATRIM® STEP 1	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				128.61		
Bifold (Example 2A)	4.000	6.625	0.343	26.50	9.100	0.206
Trifold (Example 2B)	4.000	4.375	0.514	17.50	9.000	0.136
Quadri-fold (Example 2C)	4.000	3.625	0.686	14.50	9.950	0.113
S-Fold (Example 2D)	4.000	2.500	1.028	10.00	10.280	0.078
Pretzel Fold (Example 2E)	4.000	1.750	1.317	7.00	9.219	0.054

\*Folded to Unfolded Area

HUGGIES® ULTRATRIM® STEP 2	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				153.36		
Bifold (Example 3A)	4.125	7.500	0.350	30.94	10.828	0.202
Trifold (Example 3B)	4.125	4.875	0.525	20.11	10.557	0.131
Quadri-fold (Example 3C)	4.125	3.875	0.700	15.94	11.189	0.104
S-Fold (Example 3D)	4.125	2.750	1.050	11.34	11.910	0.074
Pretzel Fold (Example 3E)	4.125	1.875	1.400	7.73	10.828	0.050

\*Folded to Unfolded Area

HUGGIES® ULTRATRIM® STEP 3	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				172.6		
Bifold (Example 4A)	4.500	8.250	0.354	37.13	13.142	0.215
Trifold (Example 4B)	4.500	5.375	0.531	24.19	12.844	0.140
Quadri-fold (Example 4C)	4.500	4.000	0.708	18.00	12.744	0.104
S-Fold (Example 4D)	4.500	3.000	1.063	13.50	14.351	0.078
Pretzel Fold (Example 4E)	4.500	1.875	1.417	8.44	11.956	0.049

\*Folded to Unfolded Area

HUGGIES® ULTRATRIM® STEP 4	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				208.41		
Bifold (Example 5A)	4.062 5	9.375	0.375	38.09	14.282	0.183
Trifold (Example 5B)	4.062 5	6.375	0.563	25.90	14.580	0.124
Quadri-fold (Example 5C)	4.062 5	4.625	0.750	18.79	14.091	0.090
S-Fold (Example 5D)	4.062 5	3.375	1.125	13.71	14.425	0.066
Pretzel Fold (Example 5E)	4.062 5	2.250	1.500	9.14	13.711	0.044

\*Folded to Unfolded Area

HUGGIES® ULTRATRIM® STEP 5	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				231.59		
Bifold (Example 6A)	4.375	9.625	0.383	42.11	16.128	0.182
Trifold (Example 6B)	4.375	6.125	0.575	26.80	15.408	0.116
Quadri-fold (Example 6C)	4.375	4.750	0.767	20.78	15.939	0.090
S-Fold (Example 6D)	4.375	3.250	1.150	14.22	16.352	0.061
Pretzel Fold (Example 6E)	4.375	2.375	1.534	10.39	15.939	0.045

\*Folded to Unfolded Area

HUGGIES® ULTRATRIM® STEP 6	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				265.52		
Bifold (Example 7A)	4.500	10.375	0.399	46.69	18.628	0.176
Trifold (Example 7B)	4.500	6.000	0.599	27.00	16.173	0.102
Quadrifold (Example 7C)	4.500	5.250	0.798	23.63	18.853	0.089
S-Fold (Example 7D)	4.500	3.750	1.197	16.88	20.199	0.064
Pretzel Fold (Example 7E)	4.500	2.500	1.596	11.25	17.955	0.042

\*Folded to Unfolded Area

#### Example 1A

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A diaper (HUGGIES® ULTRATRIM® diaper, available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "preemie" size, configured to fit a premature infant. The diaper was positioned in its unfolded configuration, *i.e.*, it's laid flat with  
 10 unretracted elastics and extended to ungathered length configuration, and, as disclosed in Table 1, the diaper was measured to have an area or "footprint" of 99.59 inches<sup>2</sup>. The area was determined as described below.

A rectangular sheet of translucent paper large enough to cover the absorbent article was obtained and utilized. The length and width of the sheet was measured to the nearest 0.01 inch.  
 15 The paper was then weighed to the nearest 0.001 gram. The weight measurement was divided by the area measurement to determine the basis weight of the paper. The article, in this instance, the diaper, was opened completely, including any fasteners, and positioned in the laid flat configuration described above, on a planar surface. The article was taped to the surface using masking tape. For other disposable absorbent articles, such as training pants and adult  
 20 incontinence pants, the articles were cut on each side between the leg openings and the waist opening prior to being positioned and taped to the planar surface. The sheet was positioned over and upon the disposable absorbent article, and a tracing of the outer perimeter, including fasteners, was made on the sheet. The paper was then cut along the traced line and weighed. The weight of the paper was multiplied by the inverse of the basis weight obtained previously.

The result was an estimate of the total square inches of the absorbent article, which was reported to the nearest 0.01 in<sup>2</sup>.

The diaper was then folded into the bifolded configuration illustrated in FIG. 4 by hand. The dimensions of the bifolded diaper were then measured. That is, the diaper was positioned  
5 on a planar surface and restrained by hand, if necessary, in the folded position, while the length measurement 138 and the width measurement 140 were obtained and recorded.

The depth measurement 142 was obtained by measuring a standard packaged bag of articles, that is, in this instance, a bag containing bifolded diapers. The height of the bag was divided by the total number of panels (for example, in a bag of 24 bifolded diapers, there are 48  
10 panels; diapers in the bag were packaged in the bag horizontally relative to the top height of the bag). These numbers were recorded. All measurements relating to diapers are in Tables 1 and 4.

As disclosed in Table 1, the width was 3.750 inches and the length was 5.750 inches. The area or "foot print" was 21.56 inches<sup>2</sup>. The calculated depth was 0.329 inches<sup>2</sup>. The  
15 volume was 7.094 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.217.

#### Example 1B

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article  
20 illustrated in FIG. 1, and described in detail herein. The diaper was a "preemie", configured to fit a premature infant. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 99.59 inches<sup>2</sup>. The diaper was folded into the trifolded configuration illustrated in FIG. 5 by hand, and was measured in the same manner as described in Example 1A.

25 As disclosed in Table 1, the width was 3.750 inches and the length was 3.875 inches. The area or "foot print" was 14.53 inches<sup>2</sup>. The calculated depth was 0.494 inches. The volume was 7.178 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its unfolded footprint was 0.146.

#### Example 1C

30 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "preemie" size, configured for a premature infant. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to



have an area or "footprint" of 99.59 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 3.750 inches and the length was 2.875 inches. The area or "foot print" was 10.78 inches<sup>2</sup>. The calculated depth was 0.658 inches. The volume was 7.094 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.108.

#### Example 1D

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "preemie" size, configured for a premature infant. The diaper was positioned in its completely unfolded configuration, and as disclosed in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 99.59 inches<sup>2</sup>. The diaper was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 3.75 inches and the length was 2.000 inches. The area or "footprint" was 7.50 inches<sup>2</sup>. The calculated depth was 0.988 inches. The volume was 7.410 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its unfolded footprint was 0.075.

#### Example 1E

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "preemie" size, configured for a premature infant. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 99.59 inches<sup>2</sup>. The diaper was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 3.750 inches and the length was 1.500 inches. The area or "foot print" was 5.63 inches<sup>2</sup>. The calculated depth was 1.317 inches. The volume was 7.408 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to its unfolded footprint was 0.056.

Example 2A

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 1" size, configured to fit an infant having a weight of about 8 to about 14 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 128.61 inches<sup>2</sup>. The diaper was folded into the bifolded configuration illustrated in FIG. 4 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.000 inches and the length was 6.625 inches. The area or "foot print" was 26.50 inches<sup>2</sup>. The calculated depth was 0.343 inches. The volume was 9.100 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.206.

Example 2B

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 1" size, configured to fit an infant having a weight of about 8 to about 14 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 128.61 inches<sup>2</sup>. The diaper was folded into the trifolded configuration illustrated in FIG. 5 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.000 inches and the length was 4.375 inches. The area or "foot print" was 17.50 inches<sup>2</sup>. The calculated depth was 0.514 inches. The volume was 9.000 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its unfolded footprint was 0.136.

Example 2C

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 1" size, configured to fit an infant having a weight of about 8 to about 14 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 128.61 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.000 inches and the length was 3.625 inches. The area or "foot print" was 14.50 inches<sup>2</sup>. The calculated depth was 0.686 inches. The volume was 9.950 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.113.

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#### Example 2D

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 1" size, configured to fit an infant having a weight of about 8 to about 14 pounds. The diaper was positioned in its completely unfolded configuration, described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 128.61 inches<sup>2</sup>. The diaper was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.000 inches and the length was 2.500 inches. The area or "footprint" was 10.000 inches<sup>2</sup>. The calculated depth was 1.028 inches. The volume was 10.280 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its unfolded footprint was 0.078.

#### Example 2E

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 1" size, configured to fit an infant having a weight of about 8 to about 14 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 128.61 inches<sup>2</sup>. The diaper was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.000 inches and the length was 1.750 inches. The area or "foot print" was 7.00 inches<sup>2</sup>. The calculated depth was 1.317 inches. The volume was 9.219 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to its unfolded footprint was 0.054.

#### Example 3A

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 2" size, configured

to fit an infant having a weight of about 12 to about 18 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 153.36 inches<sup>2</sup>. The diaper was folded into the bifolded configuration illustrated in FIG. 4 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.125 inches and the length was 7.500 inches. The area or "foot print" was 30.94 inches<sup>2</sup>. The calculated depth was 0.350 inches. The volume was 10.828 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.202.

#### Example 3B

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 2" size, configured to fit an infant having a weight of about 12 to about 18 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 153.36 inches<sup>2</sup>. The diaper was folded into the trifolded configuration illustrated in FIG. 5 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.125 inches and the length was 4.875 inches. The area of the perimeter or "footprint" was 20.11 inches<sup>2</sup>. The calculated depth was 0.525 inches. The volume was 10.557 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its unfolded footprint was 0.131.

#### Example 3C

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 2" size, configured to fit an infant having a weight of about 12 to about 18 pounds. The diaper was positioned in its unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 153.36 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.125 inches and the length was 3.875 inches. The area or "foot print" was 15.94 inches<sup>2</sup>. The calculated depth was 0.700 inches. The

volume was 11.189 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.104.

#### Example 3D

5 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 2" size, configured to fit an infant having a weight of about 12 to about 18 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 153.36 inches<sup>2</sup>. The diaper was folded  
10 into the "S" folded configuration illustrated in FIG. 7 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.125 inches and the length was 2.750 inches. The area or "foot print" was 11.34 inches<sup>2</sup>. The calculated depth was 1.050 inches. The volume was 11.910 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its  
15 unfolded footprint was 0.074.

#### Example 3E

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 2" size, configured  
20 to fit an infant having a weight of about 12 to about 18 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 153.36 inches<sup>2</sup>. The diaper was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and it was measured in the same manner as described in Example 1A.

25 As disclosed in Table 1, the width was 4.125 inches and the length was 1.875 inches. The area or "foot print" was 7.73 inches<sup>2</sup>. The calculated depth was 1.400 inches. The volume was 10.828 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to its unfolded footprint was 0.050.

#### Example 4A

30 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 3" size, configured to fit an infant having a weight of about 16 to about 28 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the

diaper was measured to have an area or "footprint" of 172.6 inches<sup>2</sup>. The diaper was folded into the bifolded configuration illustrated in FIG. 4 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.500 inches and the length was 8.250 inches. The area or "foot print" was 37.13 inches<sup>2</sup>. The calculated depth was 0.354 inches. The volume was 13.142 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.215.

#### Example 4B

10 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 3" size, configured to fit an infant having a weight of about 16 to about 28 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 172.6 inches<sup>2</sup>. The diaper was folded  
15 into the trifolded configuration illustrated in FIG. 5 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.500 inches and the length was 5.375 inches. The area or "foot print" was 24.19 inches<sup>2</sup>. The calculated depth was 0.531 inches. The volume was 12.844 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its  
20 unfolded footprint was 0.140.

#### Example 4C

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 3" size, configured  
25 to fit an infant having a weight of about 16 to about 28 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 172.6 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and it was measured in the same manner as described in Example 1A.

30 As disclosed in Table 1, the width was 4.500 inches and the length was 4.000 inches. The area or "foot print" was 18.0 inches<sup>2</sup>. The depth was 0.708 inches. The volume was 12.744 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.104.

Example 4D

5 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 3" size, configured to fit an infant having a weight of about 16 to about 28 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 172.6 inches<sup>2</sup>. The diaper was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and it was measured in the same manner as described in Example 1A.

10 As disclosed in Table 1, the width was 4.500 inches and the length was 3.000 inches. The area or "foot print" was 13.50 inches<sup>2</sup>. The calculated depth was 1.063 inches. The volume was 14.351 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its unfolded footprint was 0.078.

Example 4E

15 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 3" size, configured to fit an infant having a weight of about 16 to about 28 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 172.6 inches<sup>2</sup>. The diaper was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and it was measured in the same manner as described in Example 1A.

20 As disclosed in Table 1, the width was 4.500 inches and the length was 1.875 inches. The area or "foot print" was 8.44 inches<sup>2</sup>. The calculated depth was 1.417 inches. The volume was 11.956 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to its unfolded footprint was 0.049.

Example 5A

30 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 4" size, configured to fit an infant having a weight of about 22 to about 37 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 208.41 inches<sup>2</sup>. The diaper was folded into the bifolded configuration illustrated in FIG. 4 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.0625 inches and the length was 9.375 inches. The area or "foot print" was 38.09 inches<sup>2</sup>. The calculated depth was 0.375 inches. The volume was 14.282 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.183.

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#### Example 5B

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 4" size, configured to fit an infant having a weight of about 22 to about 37 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 208.41 inches<sup>2</sup>. The diaper was folded into the trifolded configuration illustrated in FIG. 5 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.0625 inches and the length was 6.375 inches. The area or "foot print" was 25.90 inches<sup>2</sup>. The calculated depth was 0.563 inches. The volume was 14.580 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its unfolded footprint was 0.124.

#### Example 5C

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 4" size, configured to fit an infant having a weight of about 22 to about 37 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "foot print" of 208.41 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.0625 inches and the length was 4.625 inches. The area or "foot print" was 18.79 inches<sup>2</sup>. The calculated depth was 0.750 inches. The volume was 14.091 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.090.

#### Example 5D

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 4" size, configured



to fit an infant having a weight of about 22 to about 37 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 208.41 inches<sup>2</sup>. The diaper was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.0625 inches and the length was 3.375 inches. The area or "foot print" was 13.71 inches<sup>2</sup>. The calculated depth was 1.125 inches. The volume was 14.425 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its unfolded footprint was 0.066.

10

#### Example 5E

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 4" size, configured to fit an infant having a weight of about 22 to about 37 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 208.41 inches<sup>2</sup>. The diaper was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.0625 inches and the length was 2.250 inches. The area or "foot print" was 9.14 inches<sup>2</sup>. The calculated depth was 1.500 inches. The volume was 13.711 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to its unfolded footprint was 0.044.

#### Example 6A

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 5" size, configured to fit an infant having a weight of over 27 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 231.59 inches<sup>2</sup>. The diaper was folded into the bifolded configuration illustrated in FIG. 4 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.375 inches and the length was 9.625 inches. The area or "foot print" was 42.11 inches<sup>2</sup>. The calculated depth was 0.383 inches. The

volume was 16.128 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.182.

#### Example 6B

5 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 5" size, configured to fit an infant having a weight of over 27 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 231.59 inches<sup>2</sup>. The diaper was folded into the  
10 trifolded configuration illustrated in FIG. 5 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.375 inches and the length was 6.125 inches. The area or "foot print" was 26.80 inches<sup>2</sup>. The calculated depth was 0.575 inches. The volume was 15.408 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its  
15 unfolded footprint was 0.116.

#### Example 6C

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 5" size, configured  
20 to fit an infant having a weight of over 27 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 231.59 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and it was measured in the same manner as described in Example 1A.

25 As disclosed in Table 1, the width was 4.375 inches and the length was 4.750 inches. The area or "foot print" was 20.78 inches<sup>2</sup>. The calculated depth was 0.767 inches. The volume was 15.939 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.090.

#### Example 6D

30 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 5" size, configured to fit an infant having a weight of over 27 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was

measured to have an area or "footprint" of 231.59 inches<sup>2</sup>. The diaper was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.375 inches and the length was 3.250 inches. The area of the perimeter or "foot print" was 14.22 inches<sup>2</sup>. The calculated depth was 1.150 inches. The volume was 16.352 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its unfolded footprint was 0.061.

#### Example 6E

10 A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 5" size, configured to fit an infant having a weight of over 27 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 231.59 inches<sup>2</sup>. The diaper was folded into the  
15 "Pretzel" folded configuration illustrated in FIG. 8 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.375 inches and the length was 2.375 inches. The area or "foot print" was 10.39 inches<sup>2</sup>. The calculated depth was 1.534 inches. The volume was 15.939 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to  
20 its unfolded footprint was 0.045.

#### Example 7A

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 6" size, configured  
25 to fit an infant having a weight of over 35 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 265.52 inches<sup>2</sup>. The diaper was folded into the bifolded configuration illustrated in FIG. 4 by hand, and it was measured in the same manner as described in Example 1A.

30 As disclosed in Table 1, the width was 4.500 inches and the length was 10.375 inches. The area or "foot print" was 46.69 inches<sup>2</sup>. The calculated depth was 0.399 inches. The volume was 18.628 inches<sup>3</sup>. The ratio of the footprint of the bifolded diaper compared to its unfolded footprint was 0.176.

Example 7B

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 6" size, configured to fit an infant having a weight of over 35 pounds. The diaper was laid flat in its completely unfolded configuration, and, as disclosed in Table 1, the diaper was measured to have an area or "footprint" of 265.52 inches<sup>2</sup>. The diaper was folded into the trifolded configuration illustrated in FIG. 5 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.5 inches and the length was 6.00 inches. The area or "footprint" was 27.00 inches<sup>2</sup>. The calculated depth was 0.599 inches. The volume was 16.173 inches<sup>3</sup>. The ratio of the footprint of the trifolded diaper compared to its unfolded footprint was 0.102.

Example 7C

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 6" size, configured to fit an infant having a weight of over 35 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 265.52 inches<sup>2</sup>. The diaper was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.500 inches and the length was 5.250 inches. The area or "footprint" was 23.63 inches<sup>2</sup>. The calculated depth was 0.798 inches. The volume was 18.853 inches<sup>3</sup>. The ratio of the footprint of the quadrifolded diaper compared to its unfolded footprint was 0.089.

Example 7D

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Step 6" size, configured to fit an infant having a weight of over 35 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 265.52 inches<sup>2</sup>. The diaper was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.500 inches and the length was 3.750 inches. The area or "foot print" was 16.88 inches<sup>2</sup>. The calculated depth was 1.197 inches. The volume was 20.199 inches<sup>3</sup>. The ratio of the footprint of the "S" folded diaper compared to its unfolded footprint was 0.064.

5

#### Example 7E

A diaper (HUGGIES® ULTRATRIM®) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein. The diaper was a "Ste p 6" size, configured to fit an infant having a weight of over 35 pounds. The diaper was positioned in its completely unfolded configuration, as described in Example 1A. As disclosed in Table 1, the diaper was measured to have an area or "footprint" of 265.52 inches<sup>2</sup>. The diaper was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and it was measured in the same manner as described in Example 1A.

As disclosed in Table 1, the width was 4.500 inches and the length was 2.500 inches. The area or "foot print" was 11.25 inches<sup>2</sup>. The calculated depth was 1.596 inches. The volume was 17.955 inches<sup>3</sup>. The ratio of the footprint of the "Pretzel" folded diaper compared to its unfolded footprint was 0.042.

TABLE 2. Training Pant Dimensions

HUGGIES® PULL-UPS® Training Pants (large size)	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				182.375		
Bifold (Example 7A)	4.375	10.100	0.532	44.19	23.508	0.242
Quadrifold (Example 7C)	4.375	4.750	1.063	20.78	20.090	0.114
S-Fold (Example 7D)	4.375	3.250	1.595	14.22	22.679	0.078
Pretzel Fold (Example 7E)	4.375	2.500	2.126	10.94	23.253	0.060

\*Folded to Unfolded Area

20

#### Example 8A

A training pant (HUGGIES® PULL-UPS®, available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1 and described in detail herein, except that it is an underwear-type of garment for a young child, as illustrated in

25

FIG. 12. The training pant was a "1 large" size. The training pant was positioned in its unfolded configuration. That is, the training pant was cut on each side from leg opening to waist opening, and laid flat with unretracted elastics and extended to ungathered length configuration, and measured as described previously in detail in Example 1A. As disclosed in Table 2, the training  
5 pant was measured to have an area or "footprint" of 182.375 inches<sup>2</sup>. The area was determined as described previously in Example 1A

An identical uncut training pant, which in its configuration as underwear has a pre-existing bifold (front and back panel seamed on each side) configuration was measured. That is the training pant was positioned on a planar surface and restrained by hand, if necessary, in the  
10 position, while the length measurement 138 and the width measurement 140 were obtained and recorded.

The depth measurement 142 was obtained by measuring a standard packaged bag of articles, that is, in this instance, a bag containing training pants. The height of the bag was divided by the total number of panels in a manner substantially similar that that described  
15 previously in Example 1A for diapers (training pants in the bag were packaged in the bag horizontally relative to the top height of the bag). These numbers were recorded. All measurements relating to training pants are in Tables 2 and 4.

As disclosed in Table 2, the width was 4.375 inches and the length was 10.100 inches. The area or "foot print" was 44.19 inches<sup>2</sup>. The calculated depth was 0.532 inches. The  
20 volume was 23.508 inches<sup>3</sup>. The ratio of the footprint of the folded training pant compared to its unfolded footprint was 0.242.

#### Example 8B

A training pant diaper (HUGGIES® PULL-UPS® "1 large" size available from Kimberly-  
25 Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein, except that the article is an underwear-type garment for a young child, as illustrated in FIG. 12. The training pant was positioned in its cut-open laid flat configuration, as described in Example 1A. As disclosed in Table 2, the training pant was measured to have an area or "footprint" of 182.375 inches<sup>2</sup>. The training pant was folded into  
30 the quadrifolded configuration illustrated in FIG. 6 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 2, the width was 4.375 inches and the length was 4.750 inches. The area or "foot print" was 20.78 inches<sup>2</sup>. The calculated depth was 1.063 inches. The

volume was 22.090 inches<sup>3</sup>. The ratio of the footprint of the folded training pant compared to its unfolded footprint was 0.114.

#### Example 8C

5 A training pant diaper (HUGGIES® PULL-UPS® "large" size available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein, except that the article is an underwear-type garment for a young child, as illustrated in FIG. 12. The training pant was positioned in its cut-open laid flat configuration, as described in Example 1A. As disclosed in Table 2, the training pant was  
10 measured to have an area or "footprint" of 182.375 inches<sup>2</sup>. The training pant was folded into the "S" configuration illustrated in FIG. 7 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 2, the width was 4.375 inches and the length was 3.250 inches. The area or "foot print" was 14.22 inches<sup>2</sup>. The calculated depth was 1.595 inches. The  
15 volume was 22.679 inches<sup>3</sup>. The ratio of the footprint of the folded training pant compared to its unfolded footprint was 0.078.

#### Example 8D

A training pant diaper (HUGGIES® PULL-UPS® "large" size available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1,  
20 and described in detail herein, except that the article is an underwear-type garment for a young child, as illustrated in FIG. 12. The training pant was positioned in its cut-open laid flat configuration, as described in Example 1A. As disclosed in Table 2, the training pant was measured to have an area or "footprint" of 182.375 inches<sup>2</sup>. The training pant was folded into  
25 the "Pretzel" configuration illustrated in FIG. 8 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 2, the width was 4.375 inches and the length was 2.500 inches. The area or "foot print" was 10.94 inches<sup>2</sup>. The calculated depth was 2.126 inches. The  
30 volume was 23.253 inches<sup>3</sup>. The ratio of the footprint of the folded training pant compared to its unfolded footprint was 0.060.

TABLE 3. Adult Incontinence Pant Dimensions

DEPEND® Refastenable Under Wear (large size)	Dimensions (in.)			Area (in. <sup>2</sup> )	Volume (in. <sup>3</sup> )	Ratio*
	Width	Length	Depth			
Flat/Unfolded				562.08		
Bifold (Example 7A)	7.125	15.125	0.499	107.77	53.775	0.192
Quadrifold (Example 7C)	7.125	10.250	0.998	73.03	72.885	0.130
S-Fold (Example 7D)	7.125	5.275	1.497	37.58	56.264	0.068
Pretzel Fold (Example 7E)	7.125	3.625	1.996	25.83	51.553	0.046

\*Folded to Unfolded Area



TABLE 4. Depth Measurement of Panel(s) of Product

Product	Mechanical Compression <sup>1,2,3</sup>
HUGGIES® ULTRATRIM® Preemie	0.1656
HUGGIES® ULTRATRIM® Step 1	0.1714
HUGGIES® ULTRATRIM® Step 2	0.1750
HUGGIES® ULTRATRIM® Step 3	0.1771
HUGGIES® ULTRATRIM® Step 4	0.1875
HUGGIES® ULTRATRIM® Step 5	0.1917
HUGGIES® ULTRATRIM® Step 6	0.1955
HUGGIES® PULL-UPS® Training Pants (large size)	0.2658
DEPEND® Refastenable Under Wear (large size)	0.2495

5 1. This panel dimension was determined by measuring a standard bag of diapers HUGGIES® ULTRATRIM® diapers containing bifolded diapers and dividing the height of the bag by the total number of panels (diapers positioned horizontally relative to the top height of the bag). Using this average per panel thickness, the thickness of several fold configurations were calculated by multiplying the average per panel thickness by the number of panels in the given fold configuration.

10 2. This panel dimension was determined by measuring a standard bag of HUGGIES® PULL-UPS® training pants containing bifolded constructed pants and dividing the height of the bag by the total number of panels (training pants positioned horizontally relative to the top height of the bag). Using this average per panel thickness, the thickness of several fold configurations were calculated by multiplying the average per panel thickness by the number of panels in the given fold configuration.

15 3. This panel dimension was determine by measuring a standard bag of DEPEND® Refastenable Under Wear containing bifolded constructed garments and dividing the height of the bag by the total number of panels (garments positioned horizontally relative to the top height of the bag). Using this average per panel thickness, the thickness of several fold configurations were calculated by multiplying the average per panel thickness by the number of panels in the given fold configuration.

#### Example 9A

20 An adult incontinence garment "pant" (DEPEND® Refastenable Disposable Underwear, size "large", available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein, except that it is an underwear-type of garment for an adult, as illustrated in FIG. 13. The garment was positioned in its unfolded configuration. That is, the underwear garment was cut on each side from leg  
25 opening to waist opening, and laid flat with unretracted elastics and extended to ungathered length configuration, and measured as described previously in detail in Example 1A. As disclosed in Table 3, the garment was measured to have an area or "footprint" of 562.08 inches<sup>2</sup>. The area was determined as described previously in Example 1A.

An identical uncut garment, which in its configuration as underwear has a pre-existing bifold (front and back panel formed on each anterior and posterior side) configuration, was measured. That is the garment was positioned on a planar surface and restrained by hand, if necessary, in the position, while the length measurement 138 and the width measurement 140 were obtained and recorded. The depth measurement 142 was obtained by measuring a standard packaged bag of articles, that is, in this instance, a bag containing the adult garment described herein. The height of the bag was divided by the total number of panels in a manner substantially similar that that described previously in Example 1A for diapers (the garments in the bag were packaged in the bag horizontally relative to the top height of the bag). These numbers were recorded. All measurements relating to the adult garment are in Tables 3 and 4.

As disclosed in Table 3, the width was 7.125 inches and the length was 15.125 inches. The area or "footprint" was 107.77 inches<sup>2</sup>. The calculated depth was 0.499 inches. The volume was 53.775 inches<sup>3</sup>. The ratio of the footprint of the bifolded garment compared to its unfolded footprint was 0.192.

#### Example 9B

An adult incontinence garment "pant" (DEPEND® Refastenable Disposable Underwear, size "large", available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein, except that it is an underwear-type of garment for an adult, as illustrated in FIG. 13. The garment was positioned in its cut-open laid flat configuration, as described in Example 1A. As disclosed in Table 3, the garment was measured to have an area or "footprint" of 562.08 inches<sup>2</sup>. The garment was folded into the quadrifolded configuration illustrated in FIG. 6 by hand, and was measured in the same manner as described in Example 1A.

As disclosed in Table 3, the width was 7.125 inches and the length was 10.250 inches. The area or "footprint" was 73.03 inches<sup>2</sup>. The calculated depth was 0.998 inches. The volume was 72.885 inches<sup>3</sup>. The ratio of the footprint of the folded garment compared to its unfolded footprint was 0.130.

#### Example 9C

An adult incontinence garment "pant" (DEPEND® Refastenable Disposable Underwear, size "large", available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein, except that it is an underwear-type of garment for an adult, as illustrated in FIG. 13. The garment was positioned in

its cut-open laid flat configuration, as described in Example 1A. As disclosed in Table 3, the garment was measured to have an area or "footprint" of 562.08 inches<sup>2</sup>. The garment was folded into the "S" folded configuration illustrated in FIG. 7 by hand, and was measured in the same manner as described in Example 1A.

5 As disclosed in Table 3, the width was 7.125 inches and the length was 5.275 inches. The area or "footprint" was 38.30 inches<sup>2</sup>. The calculated depth was 1.497 inches. The volume was 56.264 inches<sup>3</sup>. The ratio of the footprint of the "S" folded garment compared to its unfolded footprint was 0.068.

10

#### Example 9D

An adult incontinence garment "pant" (DEPEND® Refastenable Disposable Underwear, size "large", available from Kimberly-Clark Corporation, Neenah, WI) was produced which is similar to the article illustrated in FIG. 1, and described in detail herein, except that it is an underwear-type of garment for an adult, as illustrated in FIG. 13. The garment was positioned in  
15 its cut-open laid flat configuration, as described in Example 1A. As disclosed in Table 3, the garment was measured to have an area or "footprint" of 562.08 inches<sup>2</sup>. The garment was folded into the "Pretzel" folded configuration illustrated in FIG. 8 by hand, and was measured in the same manner as described in Example 1A.

20 As disclosed in Table 3, the width was 7.125 inches and the length was 3.625 inches. The area or "footprint" was 25.83 inches<sup>2</sup>. The calculated depth was 1.996 inches. The volume was 51.553 inches<sup>3</sup>. The ratio of the footprint of the folded garment compared to its unfolded footprint was 0.046.

25 Having described the invention in rather full detail, it will be readily apparent that various changes and modifications can be made without departing from the spirit of the invention. All of such changes and modifications are contemplated as being within the scope of the invention as defined by the appended claims and any equivalents thereto.

What is claimed is:

1. A package enclosing a single disposable absorbent article, the package comprising a first piece of material and a second piece of material, the first piece of material and  
5 the second piece of material being operatively associated with one another to enclose the absorbent article, the package having at least one viewing region in at least one of the pieces of material, the absorbent article having a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface, the garment facing surface having a graphic disposed on at least a portion thereof, and the absorbent article being in a folded configuration  
10 and enclosed within the package in a manner such that at least a portion of the graphic is situated in the viewing region.
2. The package of claim 1, wherein one of the pieces of material is more rigid than the other piece of material.  
15
3. The package of claim 2, wherein the viewing region is situated in at least a portion of the piece of material that is less rigid.
4. The package of claim 1, wherein the first piece of material is configured to have  
20 a depth and the second piece of material is adapted to serve as a lid.
5. The package of claim 4, wherein the second piece of material is more rigid than the first piece of material.
- 25 6. The package of claim 5, wherein the viewing region is situated in at least a portion of the first piece of material.
7. The package of claim 5, wherein the viewing region is situated in at least a portion of the second piece of material.  
30
8. The package according to any one of the preceding claims, wherein the absorbent article has a ratio in the folded configuration to the unfolded configuration of no more than 0.15.

9. The package according to any one of the preceding claims, wherein the absorbent article has a ratio in the folded configuration to the unfolded configuration of no more than 0.09.

10. The package according to any one of the preceding claims, wherein the package  
5 is vacuum packed.

11. A package enclosing a single disposable absorbent article, the package comprising a sheet of material having an interior surface and an exterior surface, the sheet of material having at least one viewing region and being configured to provide an interior space, the  
10 single disposable absorbent article having a folded configuration, an unfolded configuration, a bodyfacing surface and a garment facing surface, the garment facing surface having a graphic disposed on at least a portion thereof, the single disposable absorbent article being in a folded configuration and situated within the interior space of the package in a manner such that at least a portion of the graphic is situated in the viewing region.

15

12. The package of claim 11, wherein the absorbent article has a ratio in the folded configuration to the unfolded configuration of no more than 0.15.

13. The package of claim 11, wherein the absorbent article has a ratio in the folded  
20 configuration to the unfolded configuration of no more than 0.09.

14. The package of claim 11, wherein the absorbent article has a ratio in the folded configuration to the unfolded configuration of no more than 0.07.

25

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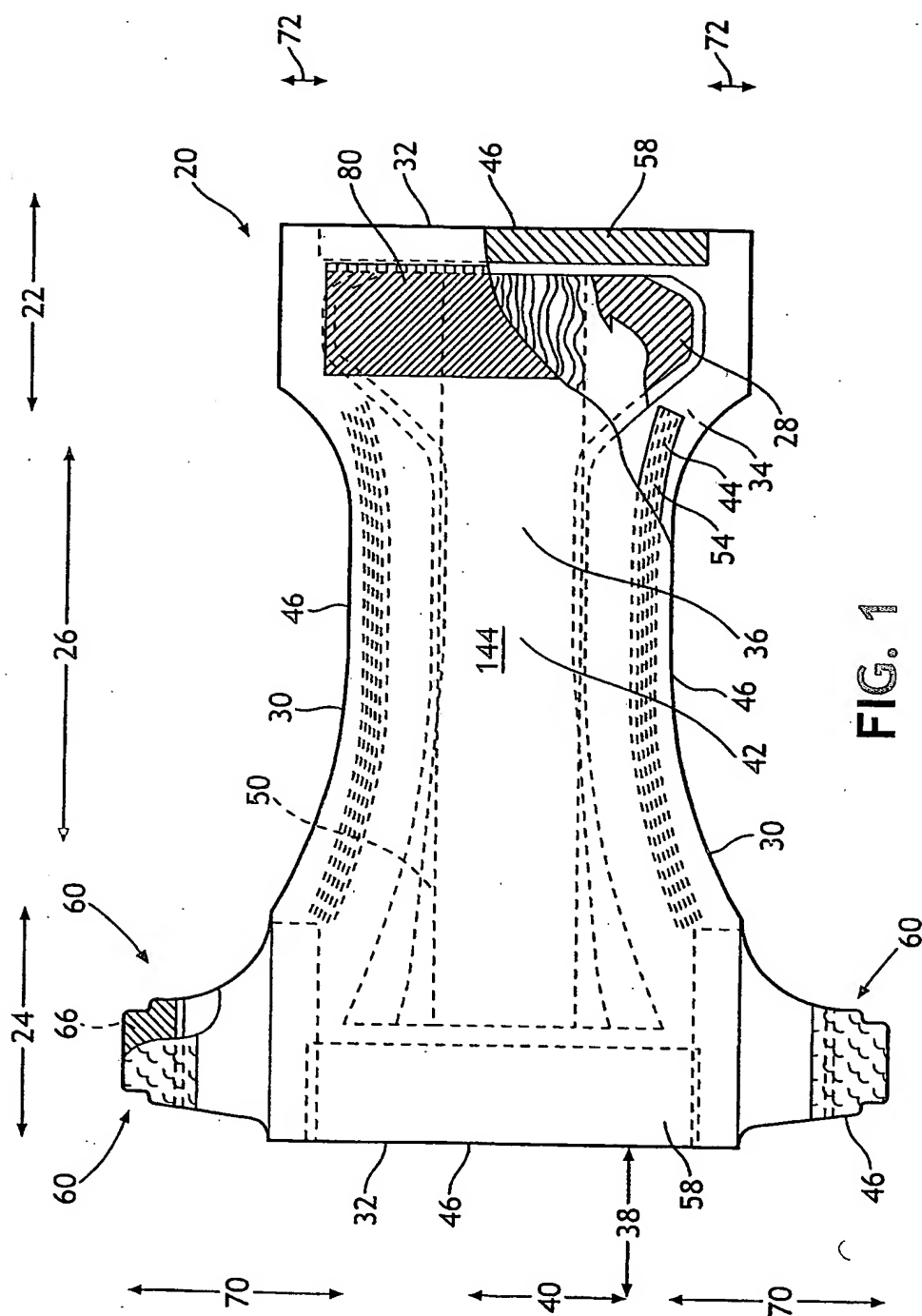


FIG. 1

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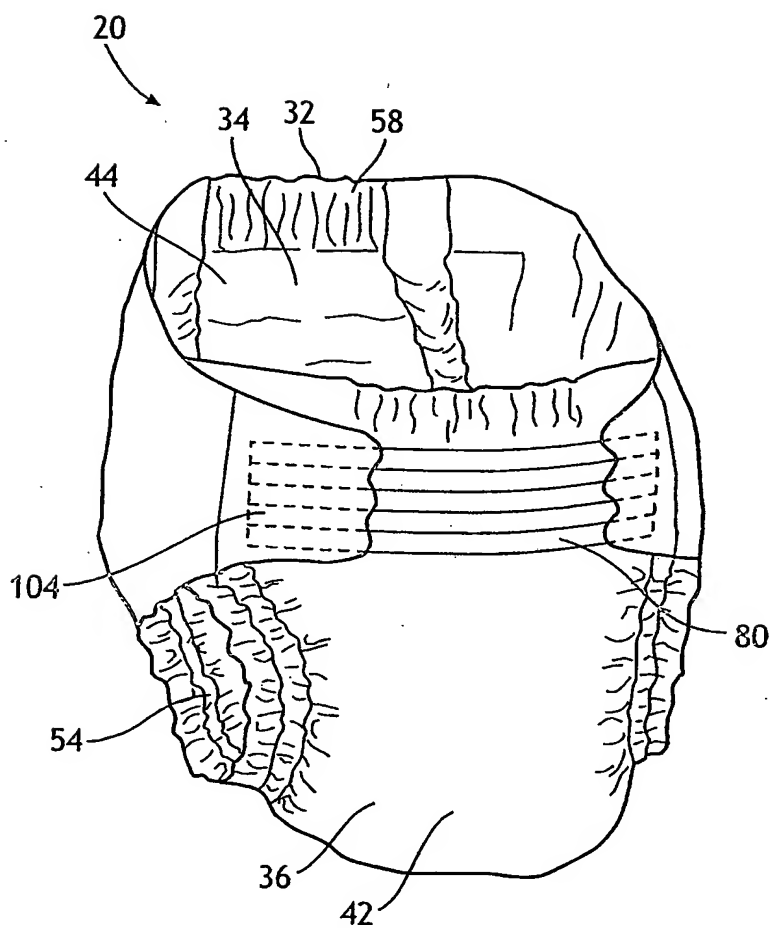


FIG. 2

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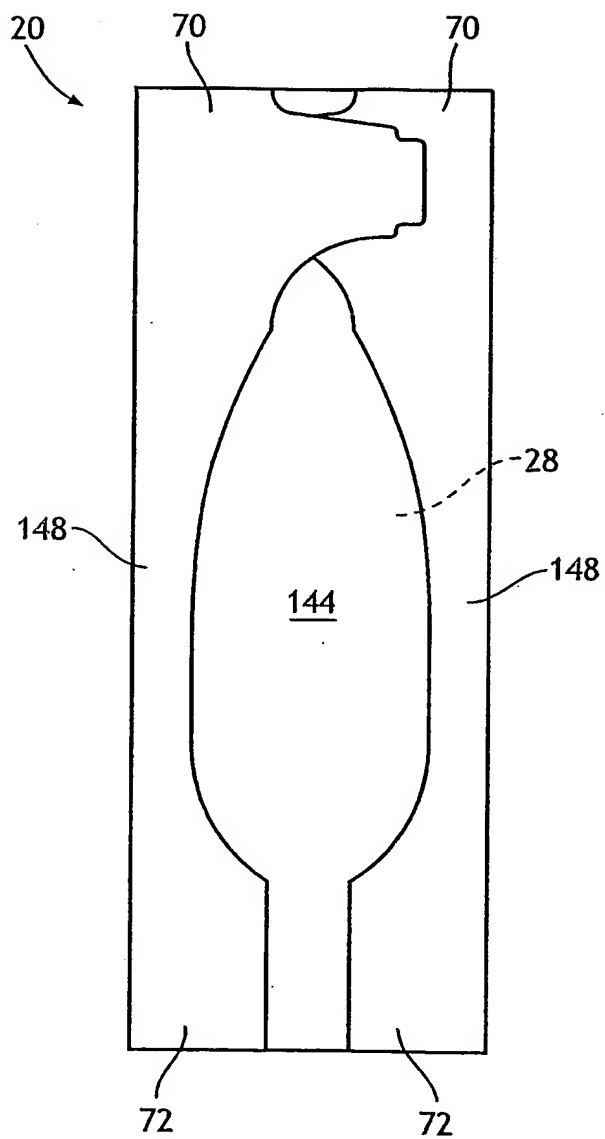
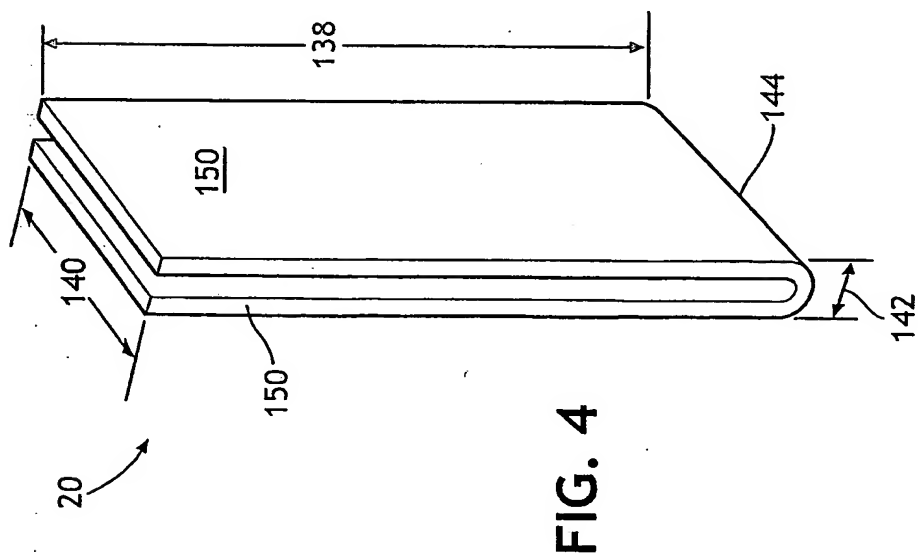
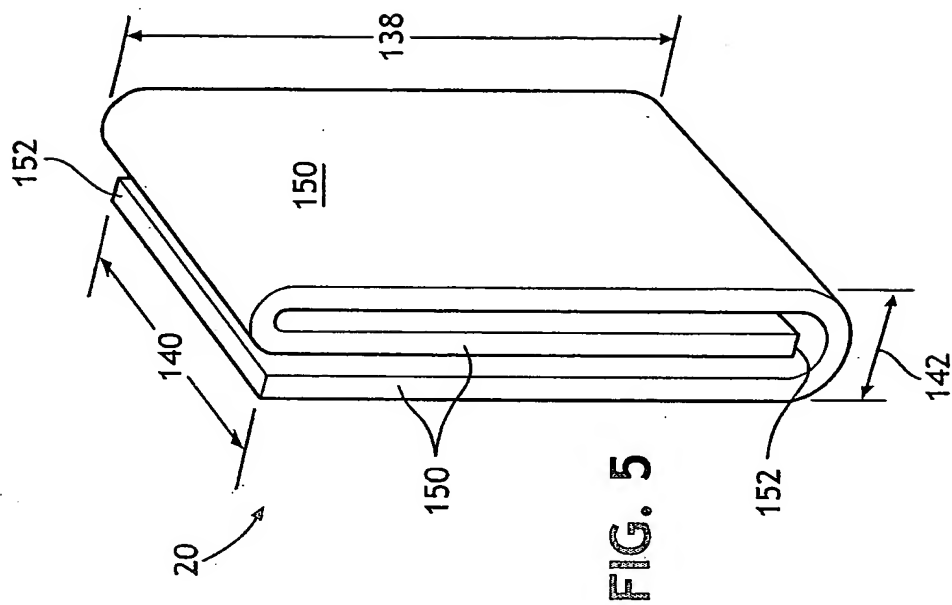


FIG. 3



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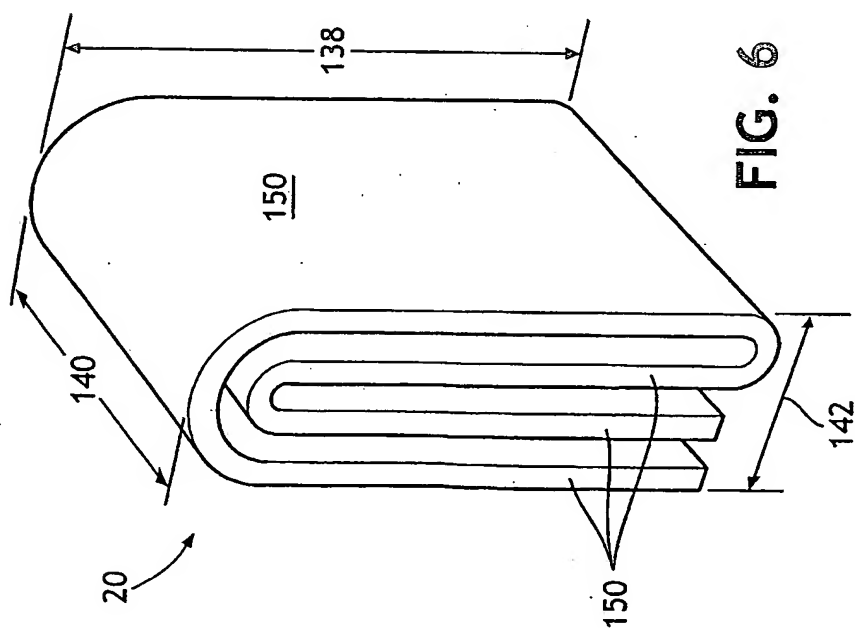
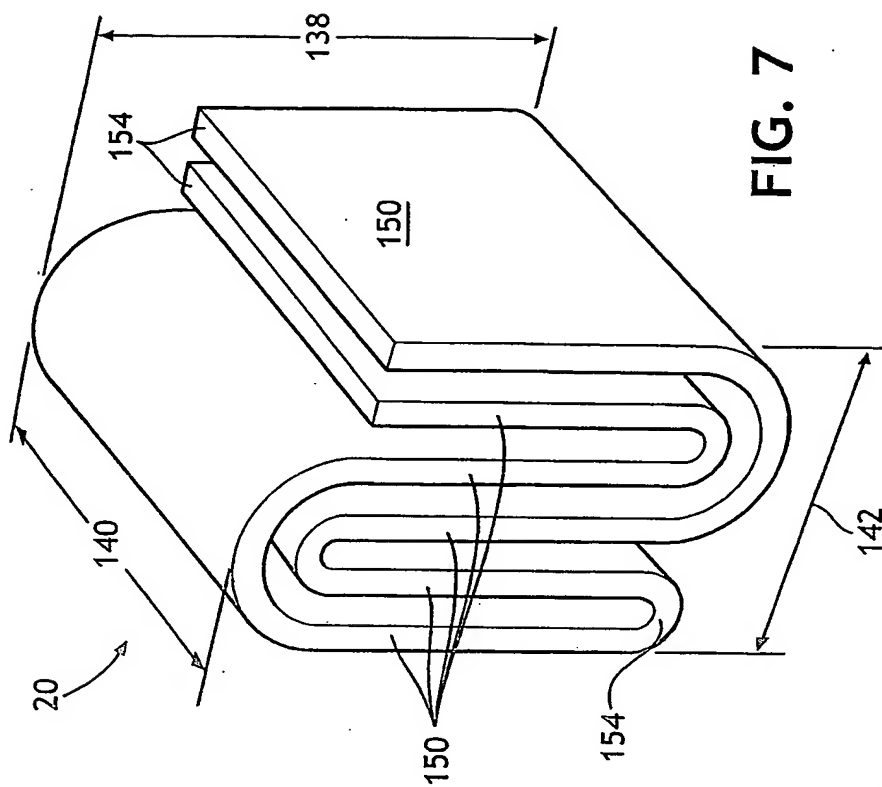


FIG. 7

FIG. 6

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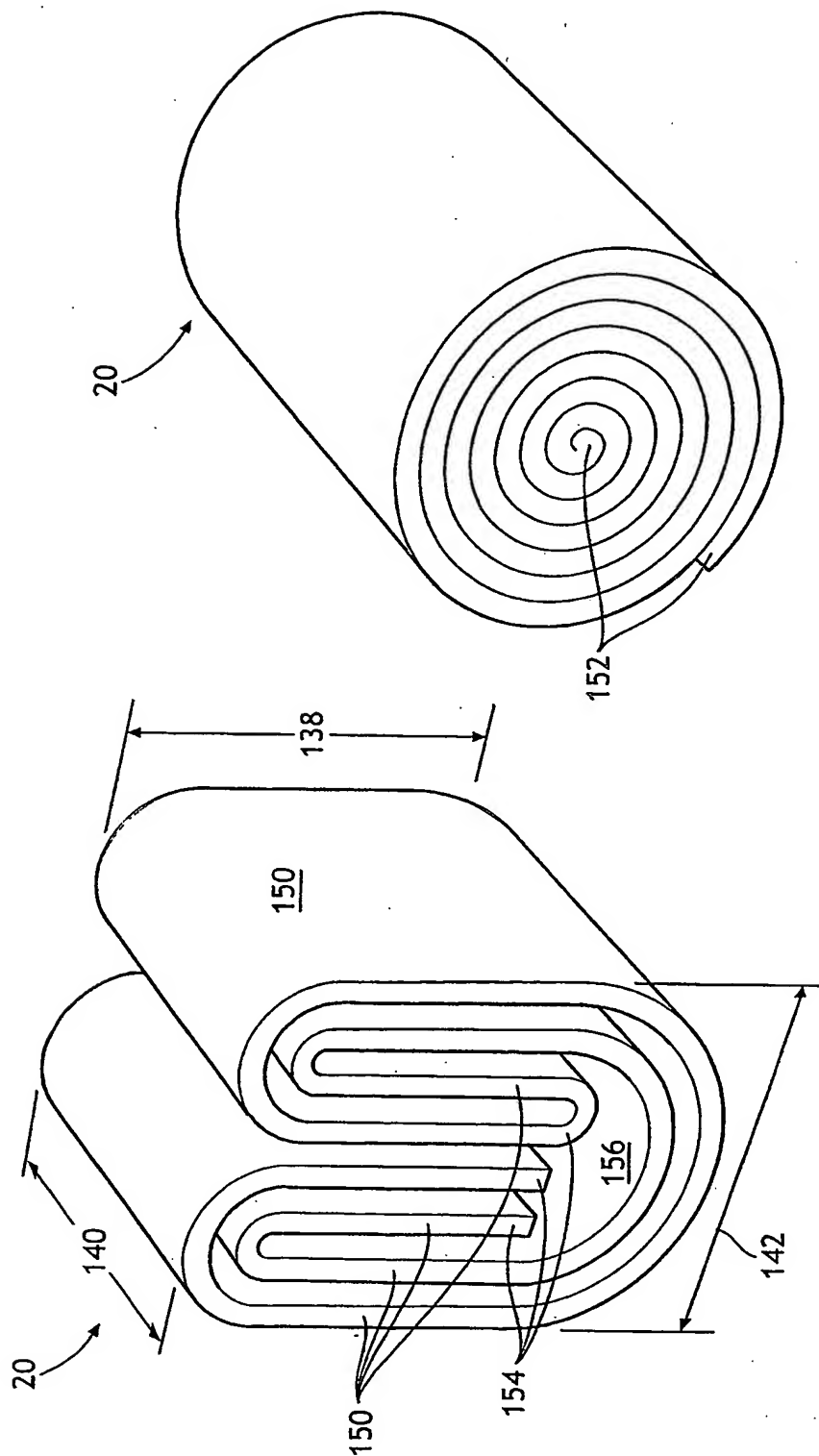


FIG. 9

FIG. 8

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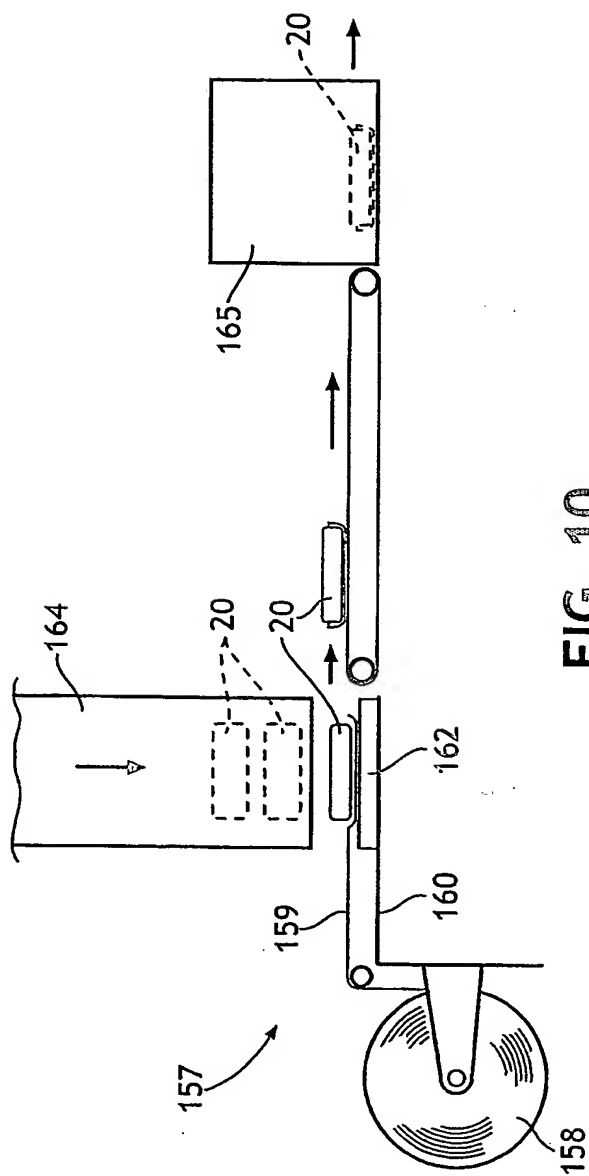


FIG. 10

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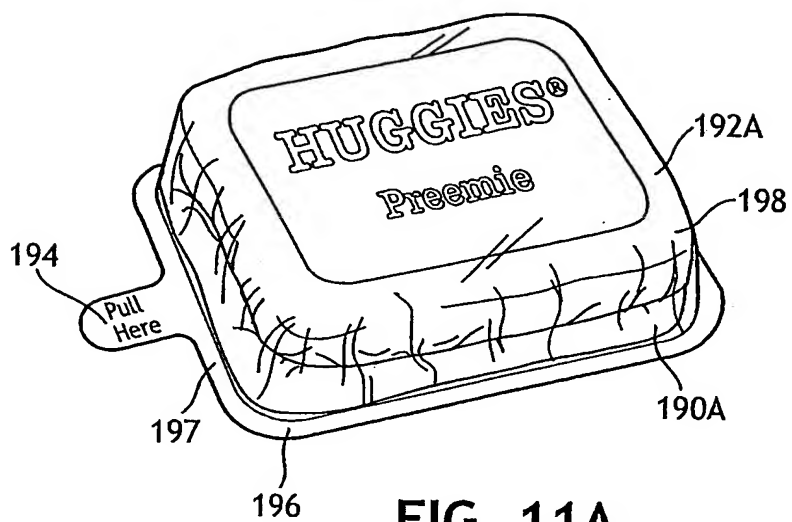


FIG. 11A

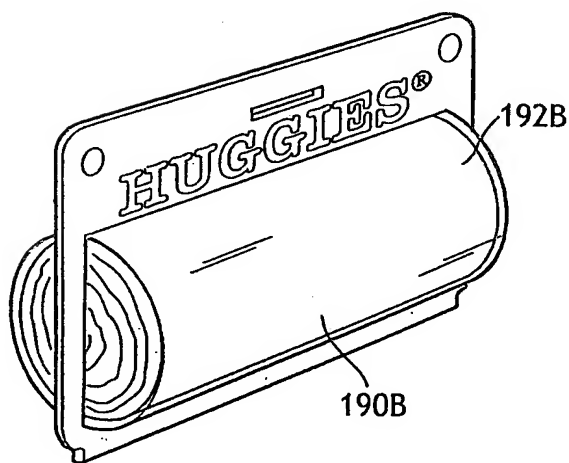


FIG. 11B

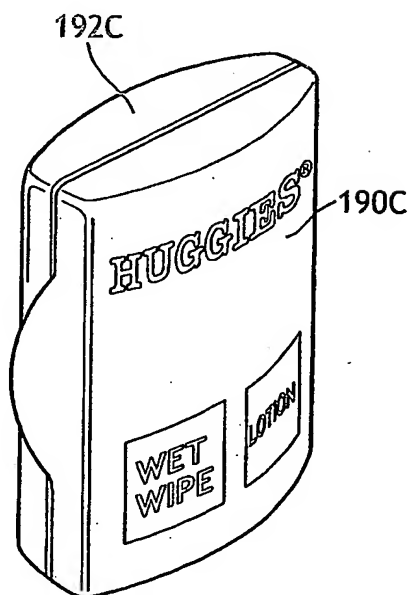


FIG. 11C

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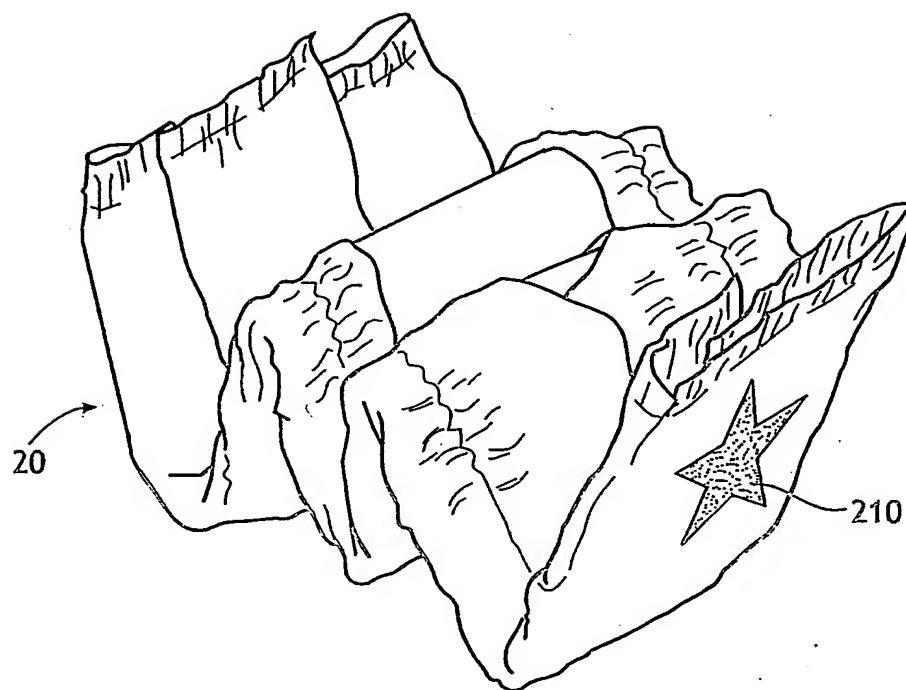


FIG. 12

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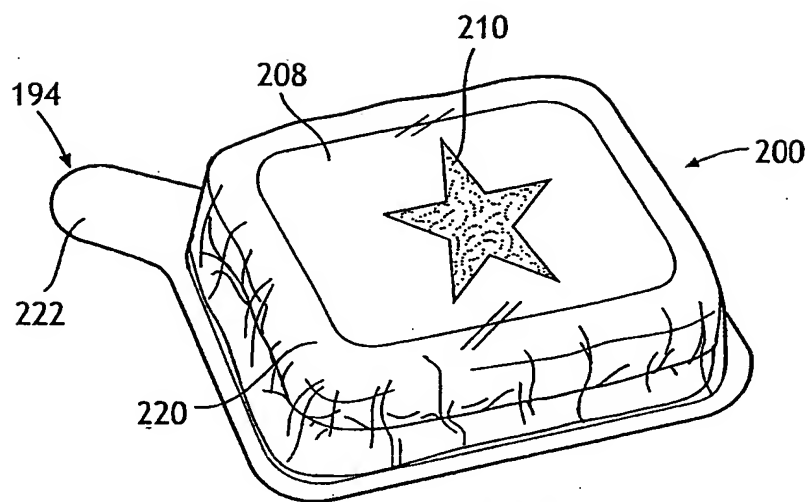


FIG. 13A

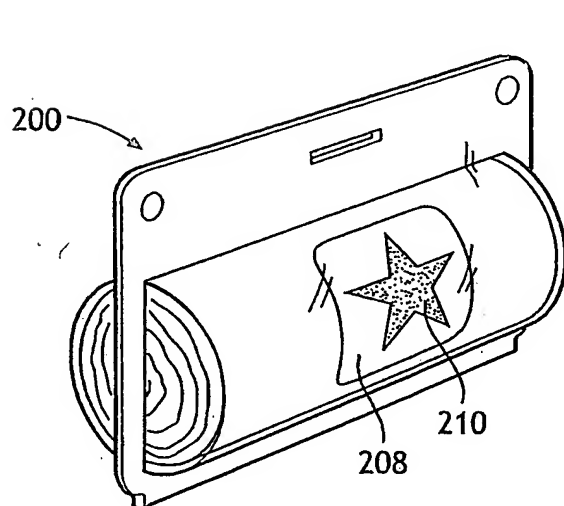


FIG. 13B

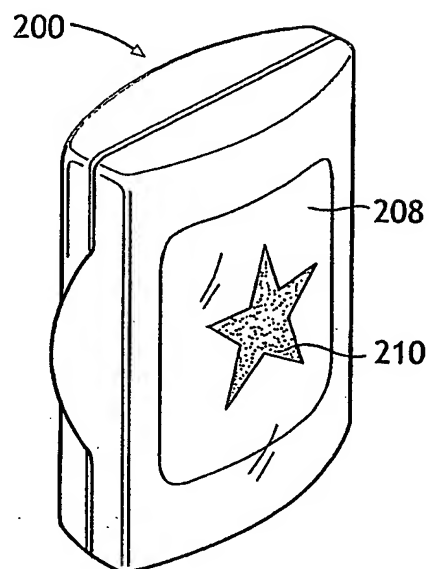


FIG. 13C

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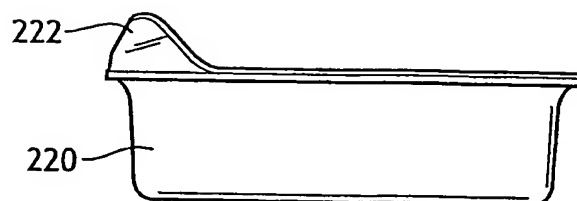


FIG. 14

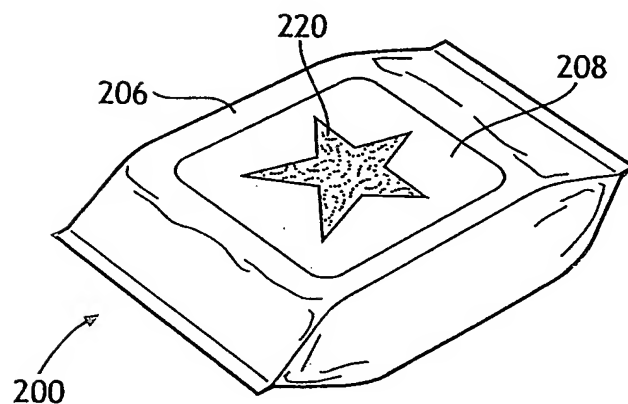


FIG. 15

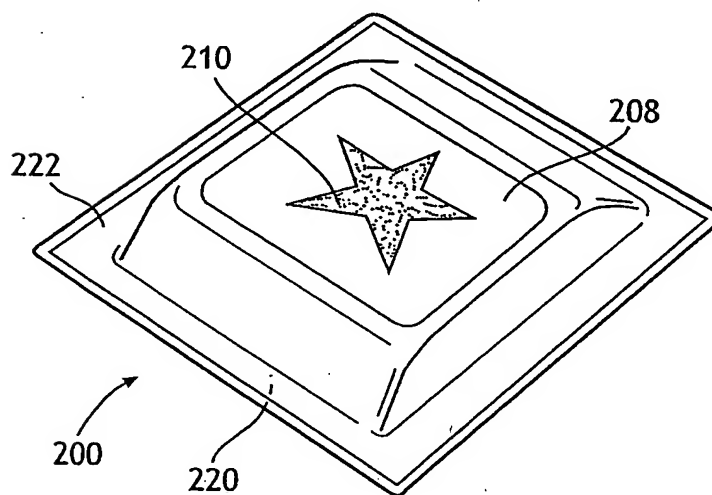


FIG. 16



## INTERNATIONAL SEARCH REPORT

PCT/US2004/004236

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC 7	A61F13/15 B65D11/00	A61F15/00 B65D85/16
	B65D75/34 B65D85/18	B65D75/30 B65D5/52
B65D5/42		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 A61F B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the International search (name of data base and, where practical, search terms used)		
EP0-Internal, PAJ		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 174 104 A (PROCTER & GAMBLE) 23 January 2002 (2002-01-23) page 3, line 36 - page 6, line 11; figure 1	1-14
A	US 2002/125171 A1 (KUSKE MARCI ELIZABETH ET AL) 12 September 2002 (2002-09-12) paragraph '0029! - paragraph '0043!; figures	1-14
A	WO 89/00037 A (MOELNLYCKE AB) 12 January 1989 (1989-01-12) page 2, line 1 - page 3, column 8; figures 1-3	1-14
	-/-	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the International filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "G" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
7 July 2004		14/07/2004
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  Boccignone, M

## INTERNATIONAL SEARCH REPORT

PCT/US2004/004236

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/004236

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61F13/15 A61F15/00 B65D75/34 B65D75/30 B65D5/42  
B65B11/00 B65D85/16 B65D85/18 B65D5/52

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61F B65D B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 174 104 A (PROCTER & GAMBLE) 23 January 2002 (2002-01-23) page 3, line 36 - page 6, line 11; figure 1	1-14
A	----- US 2002/125171 A1 (KUSKE MARCI ELIZABETH ET AL) 12 September 2002 (2002-09-12) paragraph [0029] - paragraph [0043]; figures	1-14
A	----- WO 89/00037 A (MOELNLYCKE AB) 12 January 1989 (1989-01-12) page 2, line 1 - page 3, column 8; figures 1-3	1-14
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- "&" document member of the same patent family

Date of the actual completion of the international search

9 August 2004

Date of mailing of the international search report

12.08.2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Boccignone, M